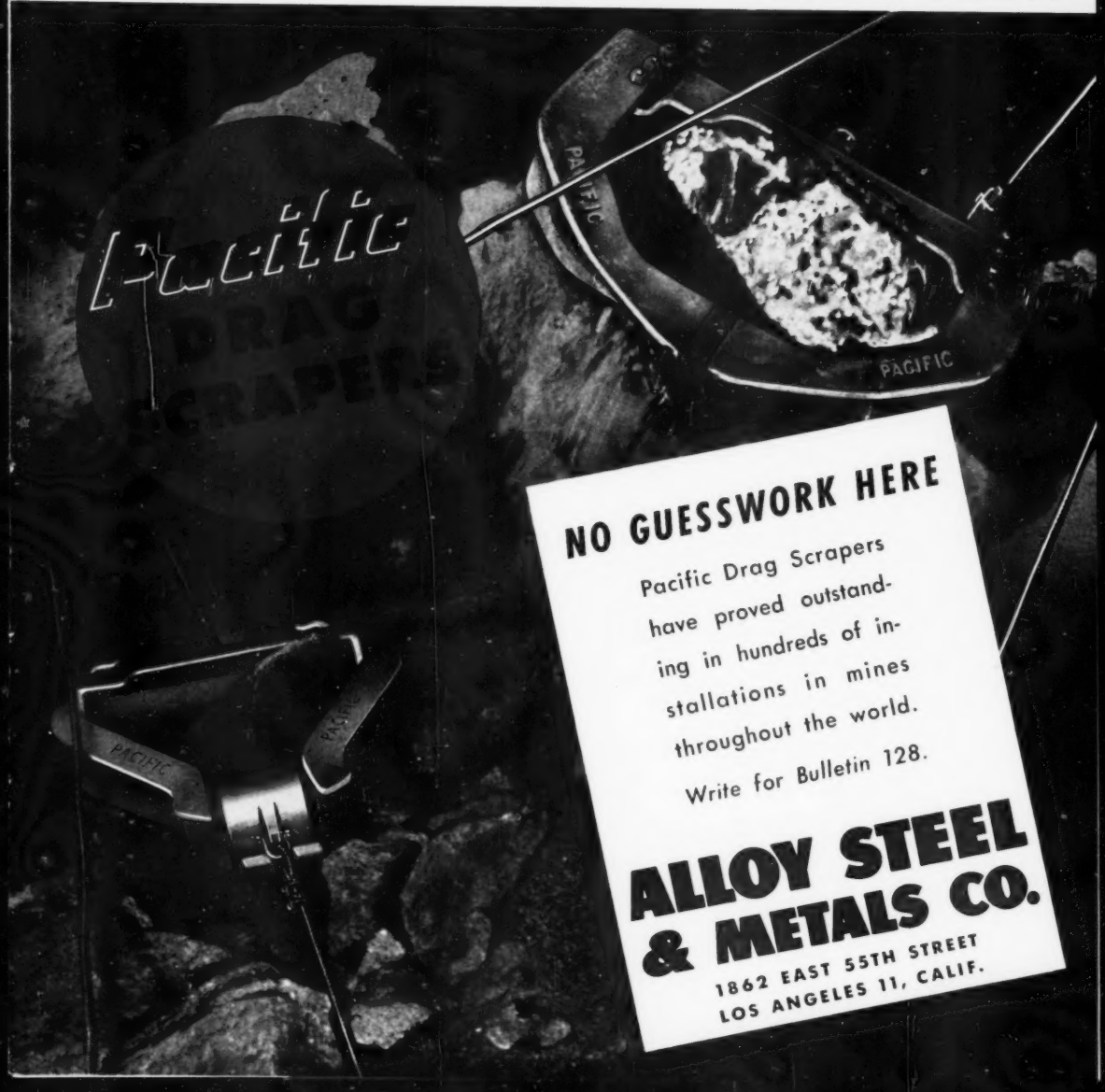
MINING WORLD

With which



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Write for Bulletin 128.

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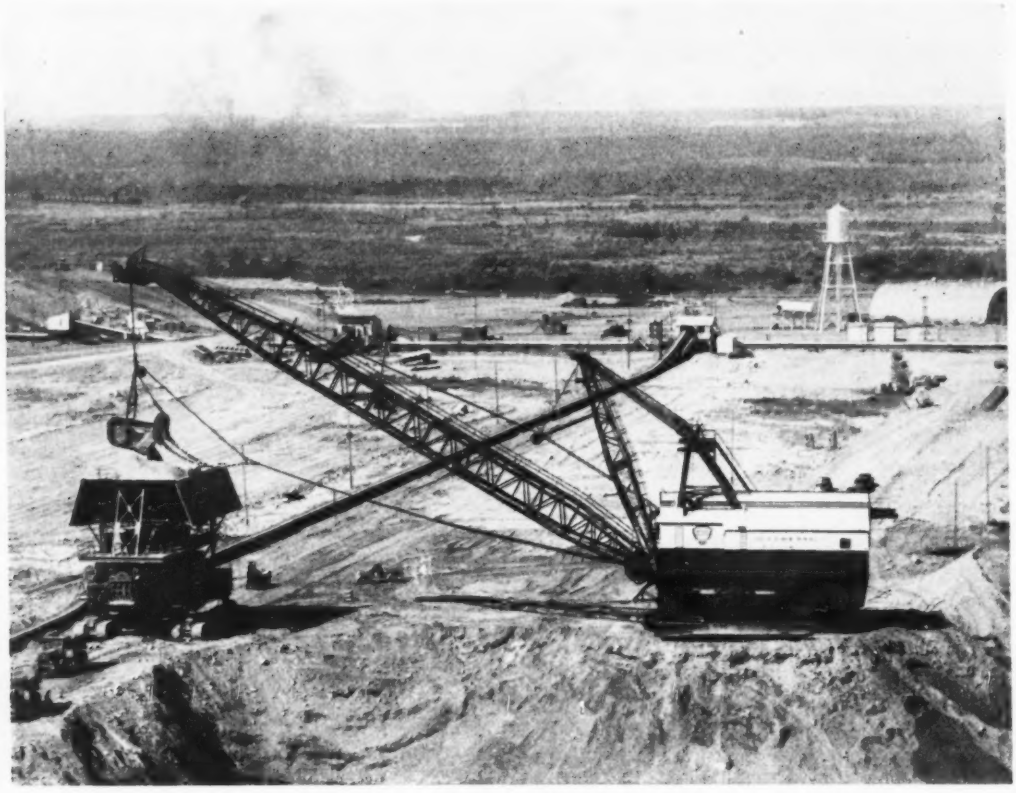

The Dragline with the Boardinghouse Reach

Loading to a portable screening plant which feeds nearly two miles of conveyor belting, a Bucyrus-Erie 1150-B walking dragline is the key machine in an unusual stripping operation on the Iron Range. The 1150-B's "boardinghouse reach", with a 30-yd. bucket on a 180-ft. boom, contributes the great range and capacity needed. Responsive Ward-Leonard variable voltage rotating control gives it the precise, fast operation that matches high efficiency with low operating costs. The 1150-B's simple, dependable walking mechanism, with its smoothly efficient action, combines with sturdy construction and advanced design to assure a long lifetime of profitable service. Those are a few of the reasons why the 1150-B is able to move vast quantities of overburden so economically — and why it was chosen for this unique operation on the Mesabi. For the solution of your stripping problems, Bucyrus-Erie offers walking draglines in all sizes.

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SOUTH MILWAUKEE, WISCONSIN

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DRIFTS AND CROSSCUTS

By Charles F. Willis

Surface Rights on Mining Claims

"Should surface rights on mining claims be retained by those who are holding the claims for mineral purposes, or should the use of the surface be allowed by the government to others for other purposes and only permit the holders of the mining claims to utilize such a portion of the surface as is necessary to their work and to get even that privilege by application to a government agency?"

This question is being asked by the United States Bureau of Land Management.

The mining industry is practically of one opinion in its comments on this proposal and states with few qualifications that "surface rights to mining claims should be retained by the claim holder," and should continue to be a part of the property of the mining claimant. Despite the unanimous protest of the industry, the bureau is proposing legislation to restrict surface rights.

In explanation of their opposition, representatives of the mining industry state that the segregation of lands as to surface rights and mineral rights in recent years has caused serious complications; that dual rights of possession of a tract of ground always breed trouble. A mining claimant who is developing his claim, they say, usually needs much of the surface area; therefore, the use of the surface by someone else for some other purpose is not practical. In fact, where there is a division of title, it has been necessary frequently for the mineral claimant to purchase or lease the surface rights at exorbitant cost.

Additional complications arising from a division of ownership were seen for large mining operations, conducted on an open-pit, caving, or quarrying basis, where the use of the entire surface is essential, and for the working of gravel deposits where all material from the surface to bedrock is mined. Any division of authority concerning surface rights can cause difficulties that often are hard to solve.

Steps in the direction of restricting surface rights have been taken. For instance, patents issued in the Mount Hood National Forest permit a mining claim owner to use only that part of the surface required for his mining operation. This restriction is in accordance with the law enacted by Congress in 1934 and known as Public Law No. 219, 73rd Congress, S. 1506, which specified that when a claim is patented, the United States reserves "all title in or to the surface of the lands and products thereon and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except under the rules and regulations of the Forest Service."

In general it might be stated that the mining industry believes that the government should continue to recognize the presumptive right of the holder of a mineral claim to the surface. Surface uses, prior to patenting, should be restricted to those necessary in connection with exploration activities, and grazing and cutting of timber should be conducted in accordance with regulations of the Forest and Range Service and limited to the needs of the proposed operation.

(Continued on Page 6)

HD-19 TORQUE

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On Any Stripping Job, Any Time

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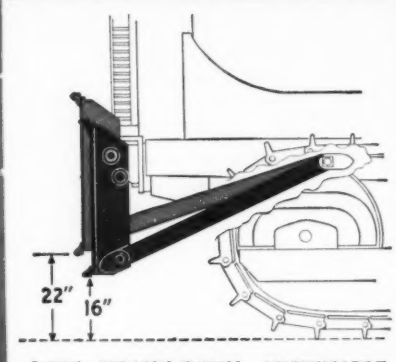
What's more — makes contact faster with any make or type scraper combination — no trundling along behind trying to catch up. Hangs on, too, throughout entire loading period — no losing scraper, no sudden, jarring contacts because there's no stopping to shift. Torque Converter automatically synchronizes HD-19's speed with speed of loading unit. And with a final, extra boost, gets scraper off with a flying start. Result — MORE YARDS MOVED AT LESS COST PER YARD.



NEW HEAVY-DUTY, ADJUSTABLE PUSHER PLATE NOW AVAILABLE FOR HD-19. It's bigger, stronger, heavier — weighs 1,600 lbs. It's adjustable — operates at 16" or 22" above ground . . . pushes any make scraper or self-powered hauling unit.

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Drifts and Crosscuts

(Continued from Page 3)

What Are Our Copper Reserves?

Some individuals in Washington are still expressing alarm over the fact that the measured and published ore reserves of United States copper mines total only 20,000,000 tons of copper contained; and that with our domestic consumption of about 1,000,000 tons of copper annually, the copper industry of the United States has but a 20 year life. Therefore, they argue, we should get as much of the metal from foreign countries as possible and preserve our copper ore reserves for the future.

Nothing would so quickly deplete these reserves as failure to utilize them in a normal way. Without large-scale operations millions and millions of tons would cease to be classified as reserves.

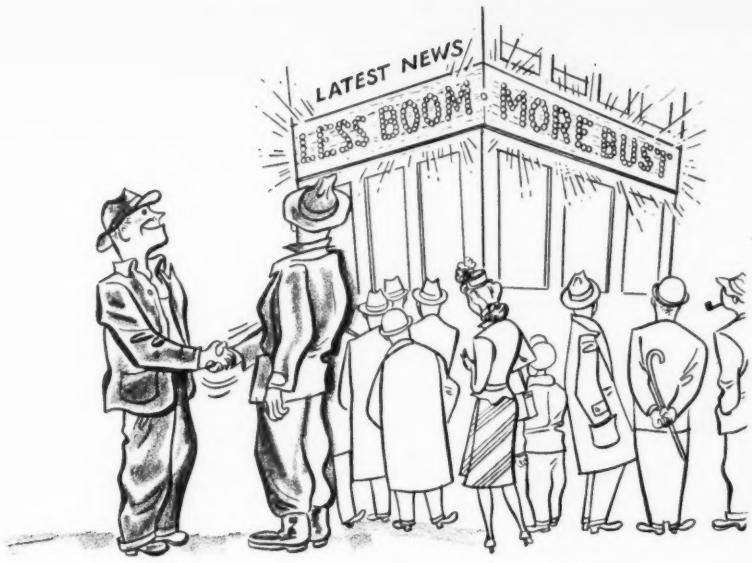
In analyzing the copper situation, one must consider what is measured as copper reserves. The figures given include only the copper ore that has been fully and completely blocked out, sampled and measured, and which, under reasonably normal conditions of costs and prices, can be converted at any time into metal at a profit. The reserves, as reported by the United States Bureau of Mines' statisticians, are those which are certain and definite under any and all conditions, and do not include anything which has any question whatsoever as to its future possibility of being brought into the commercial range.

With every penny increase in the price of copper, additional reserves become available, and for every item of cost-cutting equipment or process development more ore could be added to the total. Similarly, for every penny increase in costs, such as higher wages, higher freight rates, and the dozen and one other things that are a part of the cost of producing a pound of copper, we have a decrease in the tonnage of copper reserves that are available. Mounting costs can more quickly deplete the mines than extraction of ore. Thus costs must be watched carefully.

Metallurgical progress definitely has made possible the economic extraction of lower and lower grade ores. That there are further possibilities along this line is indicated by the trend which shows that the average grades of ore are being lowered each year and that we are now profitably mining copper ores that a decade ago would have been regarded as totally worthless. To make any assumption that the so-called marginal grades of today will never become commercial is to assume that the progress of the nation has stopped. Those who state that there are 20 million tons of copper available in this country as reserves are giving no consideration whatsoever to scientific progress and research.

The copper ore reserves, reported by the United States Bureau of Mines, do not include the 10 million tons of copper contained in dumps and tailing piles, material on which there will be no further cost for mining, but merely some process development that was not available at the time these marginal reserves were put into dumps or tailings. This process is, in many cases, already available, but there is no reason as yet to utilize it and the dumps and tailings piles continue to grow and increase as future assets.

Charles F. Willis



Good News for Blasters!

THE ROCKMASTER 16 Blasting System is *new*. And it's good news for blasters. *Now*, Atlas brings you a *sixteen-stage* milli-second delay system that cuts noise and vibration as much as 60% . . . gives you better breakage that reduces the cost of handling and milling rock.

There's more to this story. ROCKMASTER 16 helps you produce more material per pound of explosive . . . gives you more footage per round. *Sixteen* periods—a wide choice of short or long milli-second delays—add up to better control over throw, back-break, and material size. *Sixteen* delay periods fire within 550 milli-seconds!—there's less strain on timbers and roof . . . less dust and a quicker return to the face.

From pits, quarries, underground workings, and construction jobs we hear that ROCKMASTER 16 cuts drilling and secondary shooting . . . saves on time, labor, and dynamite. No wonder they're saying "*ROCKMASTER 16 is the greatest improvement in blasting methods since Atlas introduced milli-second blasting in 1945.*" Ask your Atlas representative to show you where ROCKMASTER 16 fits into your operations.

ROCKMASTER 16 TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

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STANDARD ENGINEER'S REPORT

RPM DELO

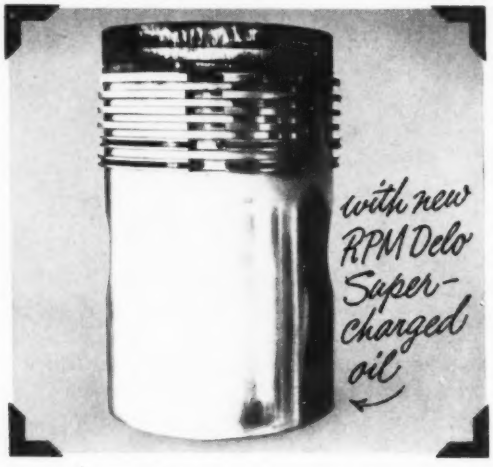
TEST DATA

LUBRICANT	RPM Delo Supercharged Lubricating Oil
UNIT	Caterpillar Diesel-D17000-V8 Cyl.
CONDITIONS	Cont. High load-Actual field oper.
FUEL	Commercially available Diesel Fuel
TEST PERIOD	4 months
FIRM	Homer Jones Ranch, Chandler, Ariz.

NEW LUBRICATING OIL STOPS ALL RING STICKING WHERE ORDINARY OIL FAILED

Specially Developed RPM DELO Supercharged Oil Solves Extra Tough Load and Carbon Problems

AFTER ONLY 625 HOURS operation on an ordinary heavy-duty type oil, an engine pulling 90% of full load rating had 39 stuck rings — only 9 of its 48 rings were free and several were broken. There were heavy lacquer and carbon deposits in ring grooves and on piston-skirts, as indicated by this unretouched photograph of one of the pistons. Besides stuck rings, note clogged oil-return holes and oil rings.



OPERATED 1582 HOURS — more than twice as long — on RPM DELO Supercharged Lubricating Oil, the same engine, running under the same load and fuel conditions, stayed efficient and clean, as this unretouched photograph shows. At the end of test all 48 rings were free, there were no piston-skirt deposits, ring-groove deposits were 50% less. Note how RPM DELO Supercharged kept oil-return holes open.

REMARKS: RPM DELO Supercharged Lubricating Oil is a new product added to our line. It solves operating problems in both Diesel and gasoline engines, especially where load conditions are extreme.

Its detergent prevents carbon and lacquer deposits on all parts, even with high sulphur-content fuels.

RPM DELO Supercharged Oil sticks on hot and cold surfaces — reduces wear under the heaviest loads. (Cylinder-wear averaged only 0.0014 inches per 1000 hours with RPM DELO Supercharged, while with the ordinary oil it was 0.0043 inches — three times greater.) RPM DELO Supercharged Lubricating Oil also contains special compounds that resist oxidation and sludging, prevent bearing corrosion and internal rusting, and stop foaming.

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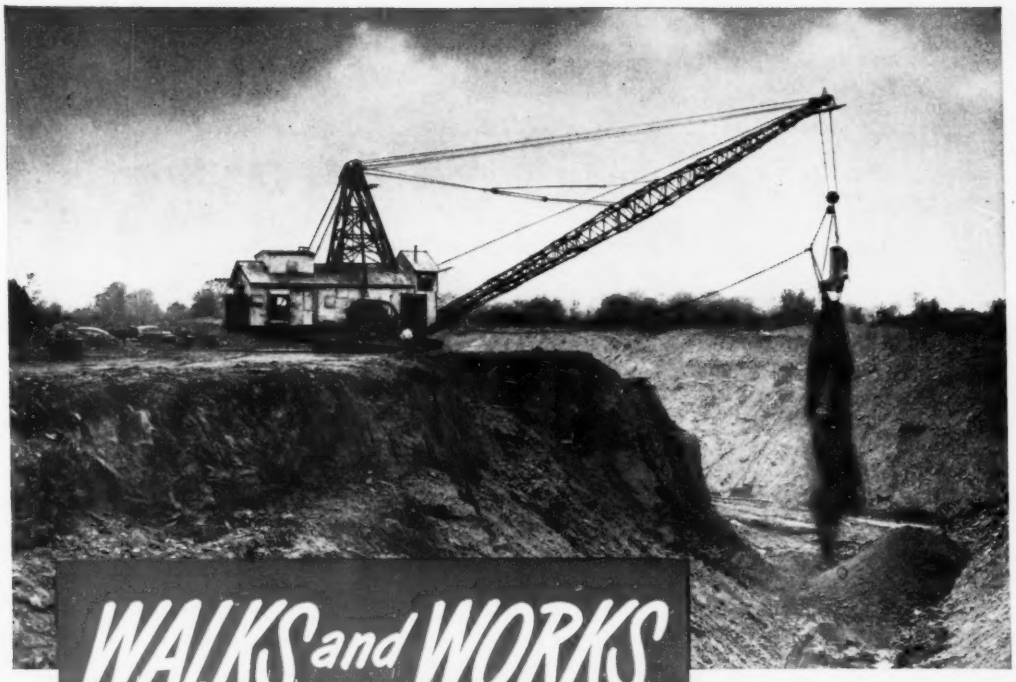

WALKS and WORKS 25% FASTER

G & F Corporation's 5-yd. dragline, powered with a General Motors Series 71 Diesel "Twin 6," literally walks away with this big job—stripping 6000 yards of overburden every 24 hours.

THIS Bucyrus-Monighan 5-yd. "walking" dragline had a cumbersome old-fashioned Diesel engine. Then a General Motors Diesel took its place. Right off the bat, production went up 25%—maintenance costs nose-dived.

The reason? GM Diesels are 2-cycle—give plenty of rugged power in units that are moderate in size and weight, easy to start on their own fuel and quick and simple to maintain.

Another feature is the way the basic Series 71 engines can be built into multiple engine units. In addition to single engines, two four-cylinder or two six-cylinder engines are offered as "Twins" and four "sixes" are compounded into a "Quad." A wide choice of reduction gears are available for all, making them applicable to every installation.

If you have tough jobs where dependable low-cost power is a *must*, better get all the facts about these versatile 2-cycle Diesels. See them at your GM Diesel distributor's or drop us a line.

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SINGLE ENGINES... Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

CAPITOL CONCENTRATES

Compromise Bill Gives Approval for Production and Exploration Incentives and May Merit Action

One of the biggest steps made recently in Congress for mining was the favorable report, on April 25, by the Engle Subcommittee of House Public Lands on the Murray-Engle bill for production and exploration incentive payments. The bill obviously is a compromise designed to placate Secretary Krug, and it also contains a few features taken from the Lemke bill. As is true with all compromises, some people will not like some features, but if legislation is to be had this year the industry had better unite behind Engle, give him complete confidence and help him bring the measure to a vote.

One novel feature of the amended bill (H. R. 976) is a policy statement instructing the Interior Department "in administering this Act, special provision shall be made for the expeditious handling of all requests, applications, or appeals from small-business enterprises." The standards set for applications for production payments are the same as those in the original bill. The exploration features have been modified so as to be fairer to both small and large mines, the contributions of the operator ranging from 10 percent for the small operator up to 90 percent for larger mines under certain conditions. Protection is afforded against labor snatching and deliberate mining of waste, which have been past, though probably uncalled for, criticisms of the old premium price plan.

Anyway, things are moving and the full Public Lands Committee of the House should have reported the bill favorably by the time this is printed.

● Another Silver Battle

Much whoopee is being made about the attempt of Senator McCarran of Nevada to bring silver into the foreign aid picture through the China Aid Bill. Senator Green of Rhode Island, who has constituted himself the watch-dog for the silver fabricating interests, is said to be planning to kill off the measure, as it might cause the price of silver to rise above the Treasury figure.

● A Miracle Is Needed

No action is expected on the McCarran bill (S. 45) providing for relief of mines shut down due to WPB-L-208, in spite of the fact that the bill has been reported favorable and now rests on the Senate calendar. Informed opinion is to the effect that nothing short of a miracle will get the bill passed.

● Foreign Copper Flood Started

It is reported that Yugoslavia sent us more than a million dollars' worth of copper in January and is continuing shipments. That should help to knock the price down still further.

● Aid British Cobalt Producer

According to the Economic Cooperation Administration, the United States will help the United Kingdom to increase its production of cobalt in return for a five-year option to buy 10 percent of the increased cobalt production for United States stockpiles. The assistance will consist of a $550,000 authorization to finance procurement of American-made equipment for use in expanding the Northern Rhodesia plant of the Rhokana Corporation, a British cobalt-producing company.

● Lead Tariff Suspension Wanted

It is a curious thing that even though the price of lead has dropped sharply, consuming and fabricating interests still are pressing legislation to suspend the lead tariff. Doesn't seem sensible, but there you are!

● Krug's Proposal Opposed

Senator Carl Hayden of Arizona, one of the sponsors of the Murray-Engle mine incentives payment bill, has stated clearly the position Secretary of the Interior Krug has put himself in by supporting only exploration contracts at this time. Senator Hayden wrote to Krug as follows:

"It seems clear to me the objectives you state will best be served by production incentives if one had to choose between production and exploration incentives. A going industry not only is vital to the national security but operating mines, through normal development and exploration, will to a certain extent fulfill both programs. The exploration incentive program only would fail without an outlet for the product and a satisfactory prospect of suitable income to the operator. In my opinion, the department's exploration program on a matching basis, especially at this time, would not be taken seriously, as few will venture funds for new discoveries when present mines are in danger of being shut down with consequent loss of reserves now available."

It is nice to know there are some Senators who understand the needs of the mining business.

● Murray-Engle Bill Corrects Deficiencies

When Secretary of the Interior Krug testified before the Engle subcommittee that he believed the President would veto a bill which has the deficiencies of the bill he vetoed two years ago, he overlooked the fact that the Murray-Engle bill (about which he was testifying) is specifically drawn so as to cure the defects the President found in the Allen bill which he vetoed.

● The Crystal Ball Failed

The economic wisdom of the Washington Brass Hats is clearly illustrated by an article in the New York *Herald-Tribune*, dated March 27, wherein it is stated that Secretary of the Interior Krug said, "As absolute essentials to our future protection the country must develop as rapidly as possible additional water power, synthetic fuels and new mineral sources, and it must be prepared to allocate scarce basic materials such as copper, lead, and zinc." Surprising what a 30-day lapse of time will do to one's crystal ball.

● Munitions Board Fares Well

The Munitions Board has continually complained that Congress has been niggardly with its appropriations. Not so this year. The Senate is expected to report out bills already passed by the House, one for 40 millions in cash and 270 millions in contracting authority and another for 525 millions and contract authority for 250 millions. This adds up to the neat sum of 1 billion 85 million dollars. It is to be hoped some of this money will be spent at home.

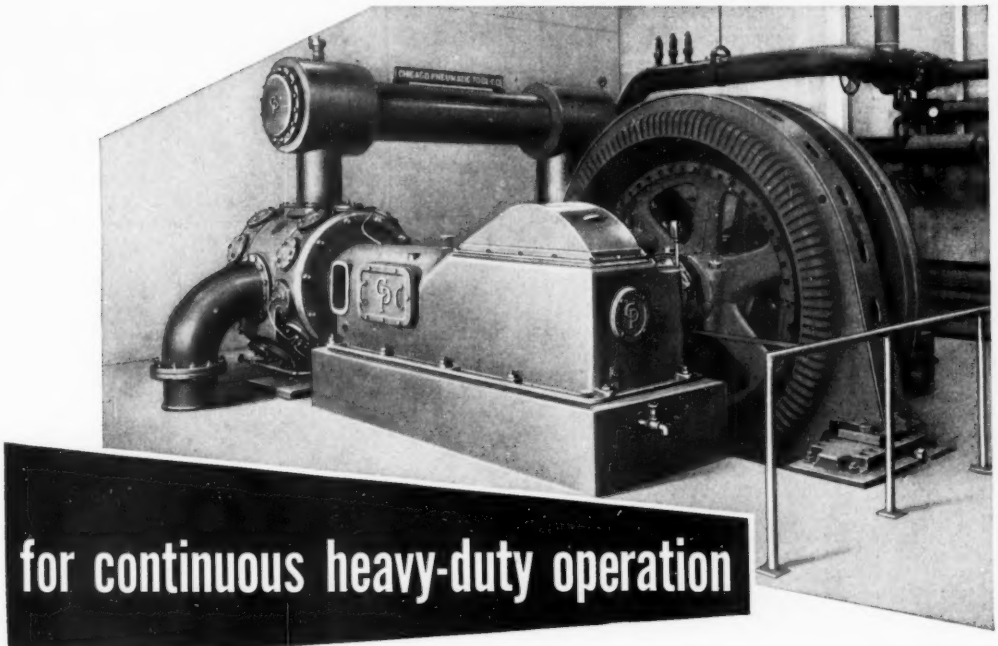
● Krug Should Be Told

Congressman Clair Engle, chairman of the mining subcommittee of the House Public Lands Committee, says about the Murray-Engle bill, H. R. 976:

"The amended bill puts production incentives on a contractual basis, as the Secretary of the Interior demanded, but makes it mandatory that anyone who can produce a metal or mineral which is required for stockpiling be given a contract within the standards written by Congress in the law. The provision for exploration incentives has been rewritten to give the most aid to the small operator without penalizing the large company which may have valuable property to be explored in the public interest."

Apparently Secretary Krug does not yet know what has happened to the mining industry, as at the end of

(Continued on Page 21)



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The CP heavy-duty, conservatively rated Class O-CE Compressor is of the horizontal, double-acting, water-cooled type, with direct-mounted synchronous motor drive; in sizes up to 1,750 h.p., for pressures up to 5,000 pounds.

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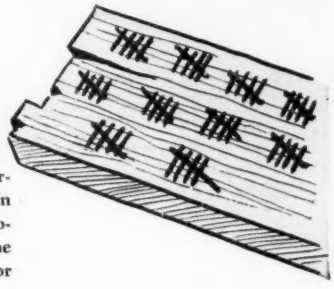

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Gardner-Denver Company, Quincy, Illinois.

The new mill of the Reeves-MacDonald across the boundary form Metaline Falls, Washington. Credited with being the most modern mill on the continent, it is the second largest zinc mill in British Columbia and is the first unit of Pend Oreille's development to get into operation.

PEND OREILLE, NEW DEVELOPMENT

Mr. Zeigler describes the development of the mines in the Metaline area of Washington, culminating in installed capacity of 2,400 tons

By W. L. Zeigler

General Manager
Pend Oreille Mines and Metals Company*

The Pend Oreille Mines and Metals Company is at present expanding its mines, surface plants, and mills in the Metaline District to handle approximately 2,400 tons per day. At the Reeves MacDonald mine in British Columbia, development work in the mine, construction of surface plants, power lines, housing, and a flotation concentrator is under way to produce and mill about 1,000 tons of ore per day. The story leading up to this expanded production is long and interesting.

In 1904, L. P. Larsen, president of the Company, entered the district and began prospecting and developing the area. A few years later, it was through his efforts that the Lehigh Cement Company built the cement plant at Metaline. In 1916, a table concentrating mill was constructed and operated during World War I. An advertisement by the Diester Concentrator Company stated that the highest grade zinc concentrate west of the Tristate field was produced in this plant. All activity ceased after the war until 1927, when the old table mill was remodeled to a flotation plant, which operated at 150 tons per day for about six months. In 1928, the mill was shut down and diamond drilling and a churn drilling program were started. This program caused many rumors and created much excitement in the district. A quotation from *The Mining Truth* of May, 1928, follows:

> "Mounties patroled the various groups in which diamond drills are running and no trespassing signs are posted all around the premises. Drills are on the Orile, Sullivan, Josephine, Chickahominy groups, and one further north near the Lead King."

Actually, however, no guards were on the property.

Watch Her Go

On October 13, 1928, the Northwest Mining Association had an excursion to Metaline Falls for the mining people of the northwest. The new flotation mill of the Grandview Mines was about ready for operation at this time. A souvenir of the trip read as follows: PUT METALINE ON THE MAP—10,000 TONS A DAY OR BUST—NOW WATCH HER GO.

In 1928, the Pend Oreille Mines and Metals Company purchased control of the Reeves MacDonald mine, which is located on the Pend Oreille River about twelve miles below Metaline, just across the international border in British Columbia. Development at this property consisted of an upper tunnel and cross cuts, which exposed several large bodies of lead-zinc ore and deep diamond drilling with results which justified driving of a lower working tunnel 800 feet below and at river level. This tunnel intersected the ore at approximately 2,900 feet from the portal and was started in 1929, the objective being reached in 1930. Shortly afterwards, the property was closed down and placed on watchman basis, except for a short time during the extension of the lower tunnel in 1937. At Metaline Falls, a new office building was completed by the company and construction on a large modern hotel to house

C. A. R. LAMBLY, general superintendent, Pend Oreille Mines and Metals Company.

W. L. ZEIGLER, author of paper.

*This paper was delivered before the 54th Annual Convention of the Northwest Mining Association, Davenport Hotel, Spokane, Washington, December 3 and 4, 1948.

employees was started but not completed in 1929. At the same time, the first commercial under-surface ore discovery was made and the mill started treating about 100 tons of ore per day, which was gradually increased to 250 tons per day. Milling and production was suspended in 1932, when the price of zinc fell to $2.65 per hundred pounds but started again in spite of low metal prices late in 1933.

Ore Bodies Extended

In 1935, diamond drilling extended the ore bodies at lower horizons and a new shaft was sunk to service this ore, while a new mill of 250 tons capacity was constructed near river level. In 1936, power was not available for expansion of the mill, so the company constructed a unique hydro-electric plant on the Metaline Falls of the Pend Oreille River of 2,200 KVA capacity at a cost of $400,000. An extensive diamond drilling program was started to insure ore for future production. *The Financial News* had a featured article September 17, 1937, on Pend Oreille by Howard T. Mitchell, who made the following remark:

> "A Canadian mining weekly sent a reporter to Pend Oreille mine. He saw only a small amount of ore, ignored, or was told nothing about diamond drilling results, and came away to describe the layout as similar to a fine big car with no engine under the hood—the ore was missing, he declared.
>
> Today that mine is equipped with a 600-ton mill which is a joy to behold—one of the most up-to-date, compact, well-built, and daylit mills in the Northwest. The writer has seen only one plant which could possibly be described as bettering it, and that is Zeigler's brand new Star mine mill built for Hecla and Bunker Hill companies, near Burke, in the Coeur d'Alenes."

First Dividends

Production increased to 700 tons per day in 1937 and the first dividend was paid by the company in 1941. In 1943, 500,000 feet of drilling had been completed, which indicated a large production future for the district. At this time, the United States Bureau of Mines entered the district and drilled in various areas for approximately three years with average results.

At the Northwest Mining Association Convention, 1946, L. M. Kinney, Pend Oreille Mine superintendent, delivered a paper on the anticipated expansion program, and I quote:

> The annual meeting of the Pend Oreille Mines & Metals Company stockholders was held June 18, 1946, and President Lewis P. Larsen made the following statement. "It is intended to provide additional milling capacity for 1,000 tons per day as soon as men, materials, and equipment are available. This would bring the rated capacity at Metaline Falls to approximately 2,000 tons per day.
>
> At the Reeves MacDonald property in which Pend Oreille Mines and Metals Company owns controlling interest, it is also contemplated, as soon as men, materials and equipment are available, to proceed with the construction of mining and milling facilities for a production of 1,000 tons of ore per day."

Water Encroachment

This program at the Pend Oreille was started January, 1946, and consists of approximately 11,000' of drifting, 3,200' of raise, and 2,000' of incline, ore and waste pockets, stations, and construction of added mill capacity and surface buildings. Mr. Kinney described the proposed incline to be equipped with a 30" conveyor belt with capacity of 350 tons per hour, also the method of level, ore, and waste haulage, and method of man and supply transportation in the incline, which would be a caterpillar tract trolley locomotive.

In 1947, the mining companies interested in the district were faced with the construction of the Boundary Dam, the back water from which would endanger all of the Metaline mining district and part of the Salmo mining district in Canada. At the public hearing held by the Army Engineers at Metaline Falls, the people interested in the probable damage, presented their case and the Army Engineers decided that the threat to this lead-zinc mining district created by this dam did not justify its construction.

Surface work was started in 1947 at the collar of the Pend Oreille incline and the new mill site on the east side of the river. The incline was connected with the raise from the main 1,700' level early in 1948 and afforded an exit for the first time on the east side of the river. The method of sinking the incline was novel, in that slusher scrapers were used entirely to remove the muck and up to a maximum distance of 1,400', at which point the connection with the lower workings was made. Mr. Kinney described in detail this incline and proposed conveyor installation in his paper, so no further mention of that will be made here.

Construction Difficulties

In March, 1948, a survey of Reeves MacDonald construction program was made to determine what machinery, equipment, and man power was available to place the property in production at the earliest possible time. It was apparent from the start that many items were on the critical list, as far as new equipment was concerned, so several War Asset Reserve Plants were investigated, as well as other used plants suitable for this operation. Suitable delivery on many of the heavy machinery items could not be obtained from manufacturers either in the United States or Canada, so it was necessary to make a number of substitutions. Structural steel was on the critical list, which made it necessary to design heavy timber frame construction for all the mine and mill buildings. No structural draftsmen were available either in Canada or the United States, making it imperative to design much of the plant as this construction work progressed.

Housing facilities at the mine were limited to a small boarding and bunk house at the river level. The first thing on the program was to construct two additional bunk houses and rehabilitate the cookhouse to accommodate sixty men.

Still under construction when the picture was taken, as is attested by the material scattered about, the new compressor house of Pend Oreille's is shown. It is on the east side of the Pend Oreille River near the site of the proposed mill. Air is scheduled to come from the compressors this month.

Pend Oreille Mines and Metals new apartment house nearing completion at Metaline Falls.

A Long Raise

In the mine, development work consisted of cutting a station on the tunnel level near the ore body for a working and ventilation raise of two compartments to make connection with the upper tunnel, a distance of about 1,000' on the slope of 54 degrees. This raise is in the footwall approximately 30' from the ore body and parallel to it, as determined by the diamond drill holes. It was started early in March and both compartments are now 760' above the tunnel level. It is anticipated that it will be holed through not later than February 1, 1949. So far as we know, this will be one of the largest raises on record without intersecting of a level or having an intermittent station.

The mineralization at the Reeves MacDonald mine consists of very fine grained argentiferous galena and fine grained yellow sphalerite in crystalline light colored limestone. Fine crystals of pyrite are present in about the same amount as the sphalerite. The average grade of the ore is about 0.8 oz. silver, 1½% lead, 6½% zinc, and 7% iron. Numerous concentration tests have shown that a zinc concentrate will be produced containing 60% zinc. Roughly, 3,000,000 tons of ore is in sight in the north and south ore bodies, which are close together, and does not take into consideration any tonnage below the river tunnel or in other ore bodies known to exist in the property but not developed.

Reeves Orebody

Unlike the extremely irregular ore bodies in the dark colored Josephine dolomite of the Metaline district, the ore in the Reeves mine dips with Reeves limestone beds at about 54 degrees and is continuous from the outcrop to the lower level. On account of the character of the Reeves limestone and widths of ore up to 80', a simple and low cost system of mining is anticipated, which will yield a large tonnage of ore per underground man shift. The ore will be transported from the station in the lower tunnel to an ore bin of 1,000 tons capacity ahead of the crushing plant by means of a trolley locomotive and 4-ton Granby type side dump cars.

From the coarse ore bins, ore will be fed to a 30 x 30" New Holland Breaker by means of a 42" apron pan feeder. The breaker will be closed circuited with a 5 x 12' vibrating screen and the oversize returned to the breaker, the mesh of the screen will be regulated to meet grinding conditions in the ball mills. Undersize from the screens will be conveyed at 150 tons per hour by means of two 24" conveyors to two concrete ball mill feed bins of 1,000 tons capacity each. On account of poor foundation footing conditions on the mill site, it was necessary to place the mill above the crushing plant, also the back waters from the proposed Waneta Dam on the river below the mine would flood any structure at a lower level.

A general view of the Pend Oreille mill as it was during the last war. Shown is the Pend Oreille River and the timber that comes down to the edge of the mill yard.

Fine Grinding Plant

The grinding and flotation will consist of two separate units of about 500 tons capacity each per day. Reeves ore is neither hard, tough, nor abrasive but on account of fine mineral dessemination, it is imperative that relatively fine grinding be done. Filters will be 6' diameter, 3 and 6 leaf, respectively, for the lead and zinc concentrates and each is in closed circuit with a 24' thickener.

At present, a 2,600 cu. ft. electric driven air compressor is installed and ready for operation. The crushing plant building is enclosed, and equipment is being set in place. The main mill building is enclosed, while the two concrete mill feed bins are poured. The miners' dry building to accommodate 200 men is well along. The lower story of this building will be occupied by mine offices, heating plant, and warehouse.

Power

Electric power at 2,000 KW will be supplied by the West Kootenay Power and Light Company from their Kootenay River hydro-electric plants. It was necessary to extend their 66,000 volt power line from the Emerald mine, a distance of about ten miles. Work on this line was delayed until the middle of September by other commitments of the power company, but is expected to be completed by the end of the year. Large transformers for this voltage are exceedingly difficult to obtain. The earliest delivery in Canada was quoted at sixteen months. In order to expedite this, reconditioned transformers were ordered in this country but on account of delays in shipment, have not arrived at this time. Heavy steel plate delivery for the large ball mills was delayed also which will set back the start of operations somewhat, but with good luck the mill should be in operation early next year.

Air Compression

The mine development at the Pend Oreille, as stated by Mr. Kinney, is now about 60 percent complete. Shortage of material and especially man power during the last two years in the Metaline district has delayed the program considerably, as well as

production from the mine. The completion of the incline was of major importance, as well as the installation of more capacity in compressed air.

The air compressor plant of 2,400 cu. ft. capacity is located now near the mill on the west side of the river and is driven by water power from Flume Creek, augmented by a synchronous motor, which either supplies power or generates current, according to the amount of water available at various seasons. The air is transported to the new section of the mine on the east side of the river through 9,000' of 6" pipe. Consequently losses are great and low air pressure prevails when all machines are operating. To increase the volume of compressed air, another compressor of 2,400 cu. ft. per minute capacity is being installed near the new mill site, and less than 1,000' from all working faces. To supply power for this machine, new power lines are under construction from the hydro-electric plant. These lines are of ample capacity to transmit all power required for the expanded mining and milling on the east side.

New Quarters

Housing for additional workmen was critical, making some solution of this problem imperative at the earliest possible time. To aggravate this condition, early this year the Lehigh Cement Company decided to double the capacity of their Metaline plant, which required many additional workmen filling all available space. On account of this, it was decided to remodel the large incompleted hotel building in Metaline Falls and install fifty-seven modern apartments. At this present time, this work is well along and some of the larger apartments will be ready for occupancy shortly after the first of the year.

The incline is now ready to be concreted on the bottom for the cat track trolley road and the installation of the conveyor. Work at the portal will consist of a retaining wall to support the rock on the upper side of the cut and the erection of the warehouse, machine shop, and tool room. A two story fireproof concrete and steel miners' dry building is under construction, which will accommodate up to 400 men on the second floor and contain mine offices, first aid room, heating plant, and storage space below.

The crushing plant and bins will be located on the hillside below the portal of the incline and served by a cross conveyor from the main conveyor in the incline. The concentrator will be designed in three units of 800 tons each, the first unit being made ready for operation in conjunction with the present west mill. Upon completion of the second unit the west mill will be closed, but left intact for further use in milling ore from the Yellow Head horizon, which requires different treatment than ores from the Josephine beds.

Pend Oreille's mill as it was during the war years when more than 600 tons of ore was put through daily.

Greater Capacity

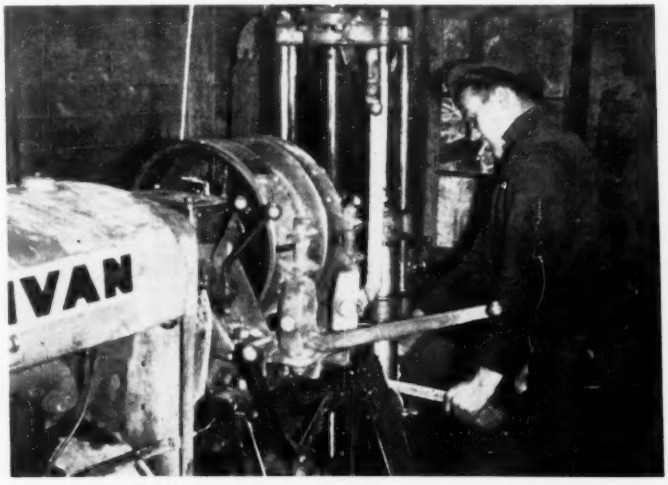
When the Pend Oreille power house was constructed in 1937, space was left for a second unit with penstock and tail race gates.

A water turbine and electric generator similar to the present unit has been ordered and delivery expected next July. Enlarging the head water conduit tunnel and other improvements will more than double the present output of the plant. Work on this part will start after high water season, the last of next July.

Underground development work will be carried on as fast as men and materials are available, much more being required before the ultimate maximum production of the mine is reached. The present mill is operated seven days a week at 650 tons per day, principally on ore from development faces. This capacity is somewhat lower than previous years, but with the present price of lead and zinc, we have a new economy and economic recovery must receive proper attention.

In conclusion, I may state the expansion program at both mines outlined here is an ambitious one. It will require much capital during this period of inflation and the time which the projects are finished will depend on many things, principally available competent workmen and supply of material in difficult supply.

A Sullivan diamond drill set up on the surface engaged in sinking a prospect hole. Over 500,000' of diamond drill holes have been sunk in an eight-year period in developing the orebody and extending limits.



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Mine Picture Viewed From Hospital Bed

● Brethren, this is writ from a room in a great hospital, a fortnight after a tough operation. Fort Miley, San Francisco. And because I'm such a durned stubborn mine-mule, I guess, I've cracked all Ft. Miley records for comeback and fast healing after such a surgery, and have gained 8 pounds in 7 days *solely on liquids*. See what mulishness can do? Now if we *all* could be as mulish towards the Missouri-mulishness of the present set-up and sundry burrocrats at Washington, the non-ferrous mining industry *might get a break on more things*, like a sane gold price, decent strategic metals policies, and *AT LEAST HALF* as much price-help for us miners as the Administration gives the farmers. Maybe, even, the skidding prices of copper, lead and zinc wouldn't skid so fast or so far down.

● Speaking of metal prices, the day this is writ to make Ye Ed's deadline (May 7) financial pages smoulder with dispatches (from New York, *where mines AIN'T*) anent tumbling copper and lead prices. Kennecott cut to 18½c, down a nickel, *to* "*Connecticut Valley basis.*" The industry's rolling nicely, isn't it! For a decade this column has moaned that we who produce copper Out West, where it *IS*, have to dance to New York and Connecticut tunes —instead of *refining the metal at its sources, with West-born power*. No use. It's still shipped across the continent, as grandpaw done it *'way back when*. And—the West *pays*. Great system!

● On that same page flamed the sixth lead cut since it started wabbling March 8 *(or got its first shove down)*. Now it's down to 14c—or was May 7. Watch marginal mines fold up now—while Farmer Brannan bolsters farm prices with his ephemeral dreams!

● And releases galore are being emitted by Interior, and printed by papers all over the West, quoting Cap Krug on "*depletion of resources*" and "*vanishing ores*" and such tosh. How long is our industry going to *take that lying down?* True, the big boys don't care a whoop; and the Little Fellows—well, too bad we haven't a few more Charlie Willises! *Period!* What really *DOES* burn me up is that (e.g.) publishers like my friend, head of Winnemucca's *Humboldt Star*, fall for it as recorded in the weekly mining page April 27. Better screen the spate of propaganda-releases from Krug, and have that young editor use his wastebasket oftener!

● Then the snappy, accurate Tonopah *Times-Bonanza* recently tore into the bubbles generated by Congress and Secretary of Agriculture Brannan in the rush to bolster the poor farmer's prices (or pad 'em higher). The editorial was headed: "*AGAIN IT'S THE POOR MINER.*" That, and the wind-up, say much: "Some day we hope the Washington bureaucrats will add just one more alphabetical setup. One that will be able to tell us honestly and fairly just why the miner has been blackballed by the government for the last twenty years or so." *Amen!*

● Lord! Just found *another* issue (April 20) of the *Humboldt Star*, giving a three-column head and half a column of useful space to another of Cap Krug's releases on "Exhausting Mineral Wealth." That in the headline ends with "*Says Krug.*" The *Star* better install a cream-separator in the offices, for Krug's office will continue its eruption of that line.

Addison M. Clark

Betty Thompson's Centennial Narratives of Old California

BODIE:
LAST OF THE LODE STRIKES

Bodie—the last of the great gold rush camps—was the highest, the wildest, the roughest, the most frenzied, the downright meanest community that ever wound up an era. It was twenty years past its time, a last frontier for the reckless and lawless adventurers who were fast becoming submerged in a California turning inexorably from mining to agriculture, and growing respectable in the process.

The first white men to explore the region that is now Mono County—Jedediah Smith in 1823 and Lt. Walker, a decade later—found it so forbidding that neither was tempted to linger. Dry, desolate, and covered with sagebrush, it was inhabited by the Mono Indians, notable chiefly because of their fondness for a white worm known as *koo-chah-bee*. This delicacy was found in the alkali waters of Mono Lake, and was so highly esteemed that the lake shores were divided into worm claims. Any infringement of a claim was a signal for open warfare.

In 1852, the area received new attention when Lt. Tredwell Moore, of the U. S. Army, led a detachment of soldiers up Bloody Canyon in pursuit of an Indian murderer. They lost their man, but found gold in a gulch near Mono Lake. This was one strike, however, that was not followed by a stampede. Even the hardiest miners were unwilling to struggle against the rigors of these wind-swept, barren hills, particularly since the more accessible diggings were still yielding rich rewards.

By 1857, however, easy gold was a thing of the past, and some Morman miners ventured up the uninviting reaches of Brown's Creek, near Mono Lake, and prospected successfully at a spot known as Dogtown Diggings, which soon achieved a population of 70.

Then came 1859 and the Comstock. All roads led to Nevada, and for the deserters from Sonora, Columbia, Chinese Camp and Jimtown, the shortest route lay over Mono Pass and through Bloody Canyon.

The first two men to cross into Mono were William S. Body, the "Dutchman from Poughkeepsie," and his partner, Taylor. They made a strike before reaching Nevada, at the spot now misspelled Bodie. Unfortunately, they did not live to enjoy their fortune long. Body died in 1860, in a snowstorm, and Taylor was killed by Indians.

Bodie itself was largely ignored by the onrushing hordes, particularly since at Aurora, a few miles farther on, phenomenally rich silver ore had been found and the Esmeralda Excitement was in full swing. The camp had two brickyards, a courthouse containing a fragment of Plymouth Rock, and a newspaper, the *Territorial Enterprise*, which for a time employed the services of Mark Twain.

Aurora was made county seat of Mono County. Then a boundary dispute occurred over the hazy California-Nevada border line. In 1863, both states claimed Aurora and the citizens voted twice on election day.—once for a Nevada ticket, and once again for the California candidates. Eventually, Aurora was set three miles within the Nevada border. Shortly afterwards the rich ores played out within 125 feet of the surface, and the camp was finished.

Meanwhile, between 1860 and 1876, desultory mining went on at Bodie. The claims were worked only in a limited fashion, since costs were so high that even $50 ore wasn't worth milling. In '72, a good strike was made in the old Bullion location, but by '74, the claim had been closed down again. The next year, however, two miners were exploring the old Bullion location, when they discovered that a cave-in had disclosed a new rock vein. They began work in a small way, packing their ore over to an arrastra at nearby Rough Creek for milling. In 1876, they sold out to a company known as the Standard Consolidated, which continued operations, although developments at Bodie still received little outside attention.

Then, in 1878, the Bodie Mining Company made an exceedingly rich strike of gold and silver ore at 300 feet. Here was news of a sort that had seemed gone forever. The Comstock was about played out—the get-rich-quick days were only memories—and now, like a miracle, appeared this great new bonanza. In August, with a small mill, the mine produced $600,000. Shares jumped from 50 cents to $54. The San Francisco Mining Exchange took a new lease on life. And—from 12,000 to 15,000 men and women poured into camp.

Here were all the familiar old figures—red-shirted prospectors, meticulous gamblers, dance-hall women, Chinese, real and would-be bad men. What they found, on arrival, was the grimmest, bleakest camp in California, laid out on a flat below Bodie Bluff. The Bluff was 8,914 feet high, the camp only a couple of hundred feet lower. A perpetual wind whipped the dust about the few frame houses. There were no trees, no vegetation except sagebrush, nothing to look at save the distant snow-capped mountains.

The only warm, comfortable places in Bodie were the saloons and gambling houses. During the first terrible winter of 1878-1879, hundreds froze to death for lack of shelter, many of them stumbling drunk from the saloons to lie fast asleep in a snowdrift. Disease killed other hundreds, and killings were so frequent that their number was never tallied

Situated in an extremely arid section, Bodie was high, dry and windy. This photo shows a view of the town at a later day after the construction of transmission lines. The false-fronted building at the left sported four desert junipers in front of it.

Wells Fargo photo

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WORLD'S MINERALS

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up, although Bodie became known as "Shooter's Town."

Bodie's reputation was so bad that a Truckee editor printed a story of a little girl en route to the camp, whose comment was, "Good-bye, God. I'm going to Bodie."

One of Bodie's two newspapers printed a speedy correction, however. According to their story, the little girl had been misquoted. What she really said was, "Good, by God! I'm going to Bodie."

All the big camps had an initial period of excitement, but at Bodie this never died down. Perhaps it was the altitude, which kept nerves strained wire-tight, or perhaps it was a feeling of "this time is the last time, so make the most of it." Nearly everyone drank and probably everyone gambled, if not at dice or cards, then in stocks, for this was an era of frenzied finance and shady market manipulations. There was only token law in Bodie and no restraints. Everything was keyed to fever-pitch, with daily stages, ore wagons and prairie schooners rushing in and out of camp, a horse market every noon in the center of town, shootings a commonplace, and stock quotations on every lip.

Fuel was so scarce that the Bodie and Benton Railroad was built to bring wood from the forests south of Mono Lake. The road was 31.7 miles long, dipped 1,900 feet in the first ten miles, and had four engines, named "Inyo," "Mono," "Yolo," and "Cono."

In 1881 the Standard Consolidated was the most profitable quartz mine in California. In 1886, Mono was second only to Nevada County in gold production. Between 1877 and 1888, Bodie produced $18,097,922. Its previous placer yield has never been estimated.

What with mining and speculation, nearly everyone in Bodie had at least one flush period, but they were almost all broke when they left. The end came suddenly. No important ore was found below 800 feet, so when the veins were worked out the camp was dead. With Bodie died an era that began in Coloma forty years before. It was the end of the Wild West in California.

It is almost symbolic that Bodie was also the last chapter for one of the legendary figures of the camps, Madame Moustache, born Eleanore Dumont of France. Madame Moustache achieved quick fame as a dealer of monte and faro in the early days at Nevada City. She moved from camp to Camp, following the new strikes, tracing down each fresh excitement. Finally, inevitably, she reappeared at Bodie. Life was no longer easy for the once-fascinating Frenchwoman. She borrowed money from a saloonkeeper, with the promise to pay him back on a certain day, "if she were still alive." She kept her promise—in a fashion. When the day arrived, she killed herself.

Capitol Concentrates

(Continued from Page 10)

April he had not yet given his blessing to the amended bill. What the small and marginal miner needs is a few tycoons on his side who can talk to Krug on his own level and tell him the facts of life. The secretary's own reporting bureaus do not seem to be doing a very good job of informing him.

● *RFC Opposition Continues*

Washington reports indicate that the Reconstruction Finance Corporation again will object to the legislation proposed by Senator James E. Murray of Montana, which would reinsert in the RFC Act provisions for mine loans in liberalized form. Mining Companies find it next to impossible to obtain loans under the general business loan procedure of RFC.

● *Who's Confused?*

The Economists' National Committee on Monetary Policy, a rather fuzzy organization, has issued one of its usual fuzzy statements against the McCarran-Engle free gold sales bill. In part it reads: "The current confusion in this country regarding the difference between a free gold market, which is an integral part of a thorough-going gold standard, and a free gold market in a nation having an irredeemable currency and no fixed gold unit, even in its international relations, is unfortunate. Our government officials should not permit this confusion to lead them to destroy our fixed monetary unit under the guise of a type of free gold market differing from that which must of necessity accompany a thorough-going gold standard."

In contrast to the above type of reasoning, Senator James E. Murray of Montana made the following forthright statement to the Alaska Mining Association: "I feel we should restore free markets in gold at the first possible opportunity. . . . The restoration of the free market for gold should be a big step toward restoring the true gold standard."

● *Price Declines Create Problem*

Jamming the Murray-Engle incentive payment bill was duck soup for the Interior Department and the Bureau of Mines 60 days ago when metal prices were still up and producers were in their usual state of complacency. But now, when scores of mines are folding up and even some of the larger coppers are suspending operations the antics of this agency, presumed to be the official protector of the domestic mining industry, take on a new and decidedly unpalatable aspect.

How far can face-saving go?

The Secretary of the Interior, speaking what his advisors tell him to, has been proved wrong. In March he stated, "In the face of a persistently expanding demand for raw materials we find that exhaustion has impaired our ability to produce many minerals in the quantities required." He then presented figures showing alarming reductions in production and implied that allocation of copper, lead and zinc would be necessary. He has opposed the production incentives of the Murray-Engle bill as unnecessary, however. Now it is literally a case of salvaging our mines and the secretary and his advisors are on a hot spot.

● *Geophysical Claims Act Proposed*

It is reported that the Interior Department contemplates proposing a bill modeled on the Geological and Geophysical Mining Claims Act proposed in the 79th Congress by Senator James E. Murray of Montana. No hearings were ever scheduled on the original bill as Senator Murray introduced it principally to draw industry comment which, on the whole, was quite satisfactory.

The American Mining Congress

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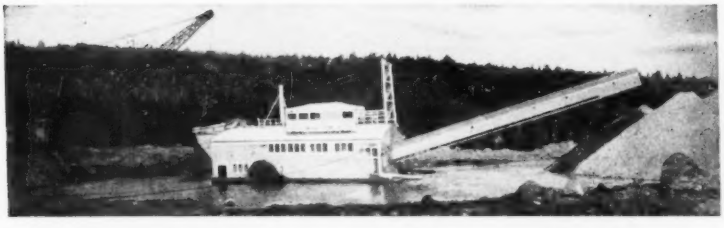

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scheduled considerable time during past conventions for discussion of the bill and a committee headed by Robert Searles of San Francisco met and discussed it, but no recommendations were made. The bill should be brought to hearings before the appropriate legislative committees of Congress and, if necessary, rewritten to meet any industry objections which might be registered.

● ***It's a Big Order***

Charles F. Willis, chairman of the Subcommittee on Public Lands of the Krug Industry Advisory Committee, has submitted a report to the secretary in which it is recommended that the Bureau of Land Management keep its operations within the present mining laws. To keep any agency of the government strictly within the spirit of a law is quite an undertaking.

● ***Assessment Work Bills Pass***

Two bills, H. R. 1754 and H. R. 3754, covering annual assessment work on mining claims, passed the House of Representatives May 2. The first postpones work for three months and the second permits the Secretary of the Interior at his discretion to postpone or suspend work for up to a year under certain conditions. There seems to be little reason for the bills not passing the Senate promptly as the sponsor of the companion Senate measure, Senator Murray of Montana, has expressed his agreement.

According to an informed source on the Senate Interior and Insular Affairs Committee, the bills would have been promptly reported if Senator Millikin of Colorado at the instance of the Colorado Mining Association had not registered a request to be heard on the proposition of amending H. R. 1754 to one year instead of three months. The Colorado association is said to be the only one of 14 associations registering comments on the House bill which demanded the one-year figure.

● ***Intrigue Kills Committee***

It appears that Senate intrigue, said to have been inspired by Senator Lucas of Illinois, has killed off the Senate Small Business Committee. The pretext, according to informed sources, was that special committees such as this are outlawed by the Reorganization Act. But this act was passed some time ago and even the Republicans were chary about kicking small business in the pants and continued the committee. In spite of the endorsement of President Truman and the support of small business organizations, small business did not rate highly enough with the Senate leaders to get a break.

The bill actually was killed in the Senate Banking and Currency Committee, headed by Senator Maybank, who, it is said, is ambitious to have a Small Business Subcommittee of Banking and Currency. As the work of each standing committee of the Senate is narrow in scope and small business touches on all phases of the economy, it appears that each of the 14 standing committees of the Senate will have to set up small business subcommittees in order to cover the field.

The small and marginal miners will suffer badly, as the Mining and Minerals Industry Subcommittee of the Senate Small Business Committee has for years championed their cause both in governmental policy matters and in drafting appropriate legislation, not to speak of this being the only place where the individual could go to get advice and sympathetic attention to his case.

It is to be hoped that Senator James E. Murray of Montana, the originator of the Senate Small Business Committee, will put up a strong fight against the cabal and secure a resolution for continuation over the adverse vote of the Maybank committee. This might be difficult, but is possible, as Murray now is a key administration man, and who would want to record a vote against small business?

● ***Freight Tax Repeal Advocated***

There is considerable sentiment developing for the repeal of the 3 percent excise tax on freight. The year-end report of the Senate Small Business Committee carried a recommendation for repeal by its Mining and Minerals Industry subcommittee which was headed by Senator Zales Ecton of Montana.

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MINING MEN AND THEIR ACTIVITIES

About men who are well known and prominent in American metal mining circles

Kenneth C. Brownell of New York has been elected president and chairman of the board of directors of the Federal Mining & Smelting Company, Wallace, Idaho, succeeding his father, *Francis H. Brownell*.

E. F. Goodner, executive vice-president of the American Gilsonite Company, reports a change in the executive offices of the firm from the Utah Oil Building in Salt Lake City to the Administration Building of the Salt Lake Refining Company at North Salt Lake.

N. E. Hill of Crosby, Minnesota, formerly chief clerk for the M. A. Hanna Company on the Cuyuna iron range, has now joined the Zontelli Brothers at their Ironton offices.

O. J. Egelston, vice-president and consulting engineer of the U. S. Smelting, Refining & Mining Company, Boston, has retired after 46 years with the company.

Wes Struber of Sweet Home, Oregon, and *Howard Murphy* have been appointed general manager and superintendent, respectively, of the Apache Mining Company, Hailey, Idaho, which is now erecting a mill in the old Bullion district.

N. G. Morgan, Jr. has been elected president and director of Madison Mines, Inc., Salt Lake City, succeeding *Harold F. Stewart*, deceased.

Arnold H. Miller, consulting engineer of New York, has been in Sinaloa, Mexico, on professional work.

George F. Schott, veteran mine operator and formerly with the Pacific Engineering, Mining & Trading Company of San Francisco, now receives his mail at 60 Leavenworth Street, Suite 28, San Francisco.

G. Donald Emigh is making his summer headquarters at 1326 Burton Avenue, Burley, Idaho, while he examines several properties, with a view toward development operations.

Wilbur T. Stuart, E. A. Brown and *E. C. Rhodhamel*, geologists with the U. S. Geological Survey at Ishpeming, Michigan, are now engaged in making a study of the depth of glacial drift on the Marquette iron range. Upon completion of this study, a topographic map of the bed rock will be made indicating the pre-glacial drainage pattern to act as future guide to water supplies for concentrating and other purposes.

Glenville H. Collins, mining engineer of Santa Barbara, California, is devoting the current season in making uranium explorations in British Columbia.

Robert C. Wallace, formerly superintendent at the Argonne mine of the M. A. Hanna Company, has been appointed assistant superintendent for the Cooley district iron properties of Butler Brothers, St. Paul, Minnesota.

H. D. Stark, retired general superintendent of the Jones & Laughlin Steel Corporation's Pittsburgh works, and *Harry Saxer*, retired general superintendent of the corporation's Aliquippa works, has been appointed to the staff of the United States representative of the Anglo-French-American Steel Commission for Western Germany.

Eric A. Berg recently resigned his position with the Wire and Metal Products Company to join the Research Division of the International Minerals & Chemical Corporation at Mulberry, Florida.

Charles M. Schwab of the Bunker Hill & Sullivan Mining and Concentrating Company's engineering staff, Kellogg, Idaho, has been placed in charge of the firm's new block caving program by which some 5,000,000 tons of low-grade ore will be mined and milled.

Raymond G. Foote, assistant treasurer of the Oliver Iron Mining Company, Duluth, Minnesota, retired recently after 48 years of service. He was succeeded by *Arthur L. Anderson*, while *Raymond L. Larson* became treasurer.

G. A. Franz, Jr., of Ouray, Colorado, has been appointed Colorado Mine Inspector for District 4, succeeding the late *Dan McNaughton*.

Donald M. McLaughlin has been elected to the board of the Bunker Hill & Sullivan Mining and Concentrating Company, Kellogg, Idaho, replacing *P. R. Bradley*, deceased.

A. L. Hayes, superintendent of the Empire Zinc Company property at Hanover, New Mexico, has been transferred to the New York office of the parent organization at 160 Front Street, New York 7. His home address is 3103 Fairfield Avenue, New York 63.

Valentine Pasavento of Ironwood, Michigan, has succeeded the late *J. F. Petrusha* as master mechanic at the Newport mine, operated by Pickands Mather & Company.

Earl H. Beistline, E.M., has been appointed Dean of the School of Mines of the University of Alaska. His appointment is effective July 1.

Howard G. Schoenike, engineer with the M. A. Hanna Company, has been transferred from Crosby, Minnesota, to the firm's Iron River, Michigan, operations.

H. J. Leaver has been appointed assistant to the chief engineer of the Jones & Laughlin Steel Corporation.

C. T. Van Winkle, retired president and general manager of the Rico Argentine Mining Company, Rico, Colorado, has had a change of address to 1242 E. S. Temple Street, Salt Lake City. He also retains offices in the Dooly Building.

C. B. Hoskins, formerly general manager for the Saranac Mining Company's operations at Philipsburg, Montana, is now residing at 1130 South Higgins Avenue, Missoula, Montana.

James C. Stewart, formerly of Bisbee, Arizona, has been named manager of the U. S. Atomic Energy Commission's area office at Schenectady, New York. Previous to this appointment, he was AEC project engineer at the Oak Ridge National Laboratory.

John R. Shoffner, Consulting En-

HOWARD I. YOUNG, left, an officer of the American Zinc Institute since it was organized 31 years ago, shows his successor as president, EDWARD H. SNYDER, a clock which was given Young by the Institute's directors in token of his long service. Young, who is president of American Zinc, Lead and Smelting Company of St. Louis, announced he would end his term as Institute president after 14 years in that capacity and 17 years as treasurer. Snyder was elected the Institute's new president at its thirty-first annual meeting in April.

gineers, have had a change of address to 120 Market Street, Kittanning, Pennsylvania.

Joseph Hafen, president of the Old English Gold Corporation, is now located at his firm's mining and milling operation and may be addressed at Troy Canyon via Tonopah, Nevada.

Harlan M. Erskine, previously district engineer for the U. S. Geological Survey at Charleston, West Virginia, has assumed the duties of district engineer for the Bismarck, North Dakota, office. He replaces *R. E. Marsh*, who is now district engineer in Juneau, Alaska. Other personnel changes announced by the Survey include: *John C. Berkenbosch*, who was transferred from Ocala, Florida, to assume charge of the St. Louis office; *John W. Odell*, formerly in charge of the St. Louis office, to engineer in charge of the Ithaca, New York office, and *Joseph I. Perrey*, transferred from the Indianapolis office to replace Erskine as district engineer at Charleston.

Sam S. Coldren recently resigned his position with the Acoje Mining Company at Santa Cruz, Zambales, to become manager of the Misamis Chromite Company, Na-awan, Initao, Misamis Oriental, Philippines.

K. Peters, formerly manager in charge of the mining and metallurgical operations of the Mahad Dahab property of the Saudi Arabian Mining Syndicate, was recently appointed consultant on mining affairs to the Kingdom of Saudi Arabia. He will make his headquarters at Jedda.

WILLIAM LANGDON
of Kearsarge, Michigan, is now captain of Calumet & Hecla's Kearsarge copper mine, replacing John Wade, deceased.

Gailen T. Vandel, president of the Mining Association of Montana, is residing temporarily at 203 "K" Street, Helena, Montana.

Obituaries

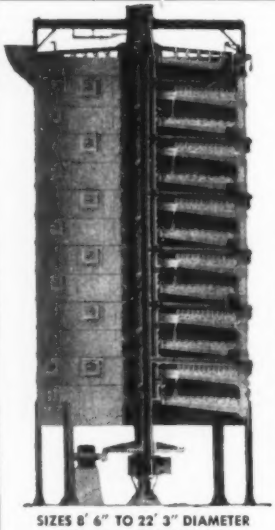
Col. Harry H. Stout, 77, superintendent of the Phelps Dodge Corporation's Copper Queen smelter, Douglas, Arizona, from 1917 to 1921, died April 13 at Plainfield, New Jersey. Following his superintendency at Douglas, Stout became consulting metallurgist for the corporation in New York City, which position he held until his retirement in 1931.

Daniel M. McAllister, 69, active in Mexican mining activities since 1909, died in San Luis Potosi City, San Luis Potosi, Mexico in April. A native of Boston, McAllister went to Mexico as a graduate mining engineer from Harvard. During his 40 years of mining activity, he was superintendent for The Fresnillo Company and then for the Cia. Minera de La Paz at Matehuala, San Luis Potosi, after which he did some private mining, finally becoming a consultant.

John Tregear, 63, mining captain of the Oliver Iron Mining Company's Soudan mine, died April 23 at Tower, Minnesota. Tregear had been with Oliver since 1906 and at the Soudan since 1928.

Russell E. Reilly, 60, manager of the Homestake Mining Company's coal mining operations at Wyodak and long-time resident of Lead, South Dakota, died April 16 at Gillette, Wyoming. Reilly had been an employee of Homestake since 1908 and manager of the Wyodak operations since 1941.

Peter Schultz, 58, foreman of the reverberatory department at the Douglas Smelter of the Phelps Dodge Corporation, Arizona, died April 24. He had been with the smelting unit since 1911.



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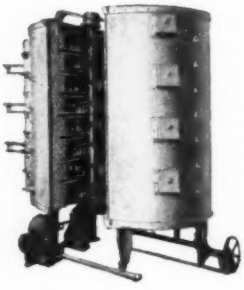

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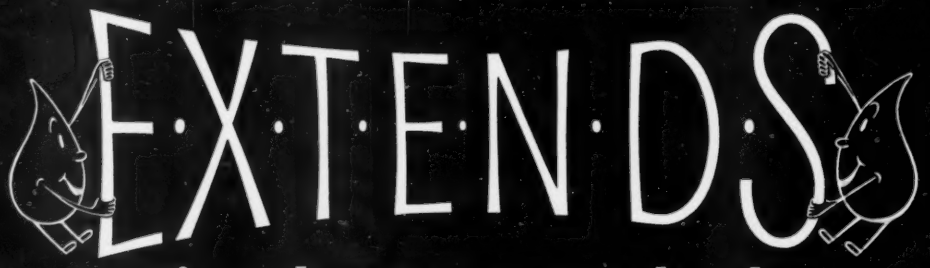

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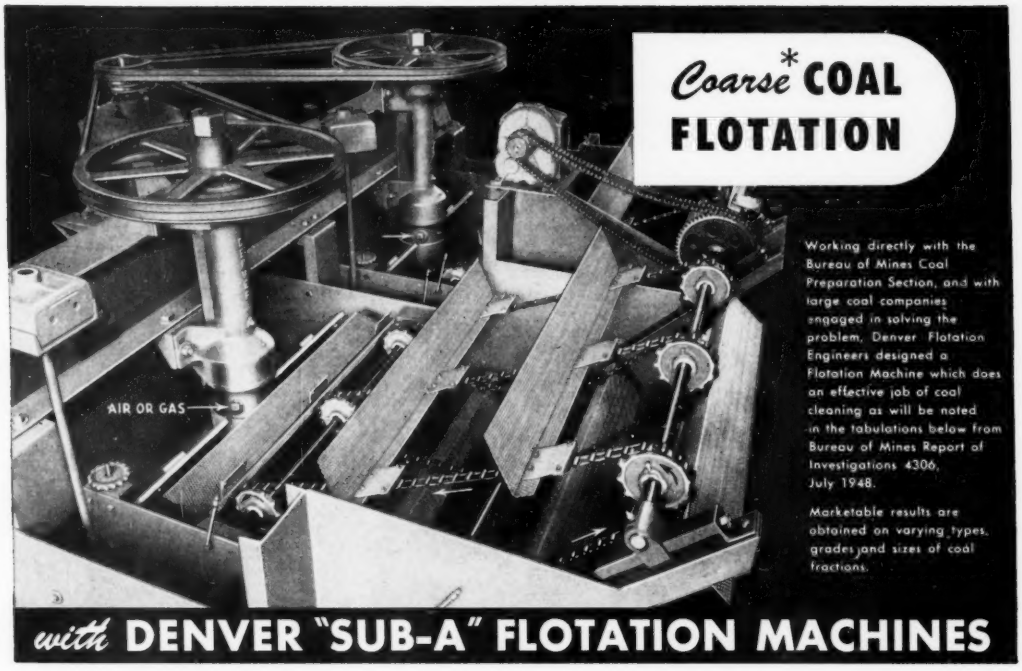

Coarse* COAL FLOTATION

Working directly with the Bureau of Mines Coal Preparation Section, and with large coal companies engaged in solving the problem, Denver Flotation Engineers designed a Flotation Machine which does an effective job of coal cleaning as will be noted in the tabulations below from Bureau of Mines Report of Investigations 4306, July 1948.

Marketable results are obtained on varying types, grades and sizes of coal fractions.

with DENVER "SUB-A" FLOTATION MACHINES

PROBLEM • Treating coal fractions from 1/16"-0. Two objectives are sought—

1) *to save marketable grade of coal in these sizes and*

2) *eliminate stream pollution from wasted slurry water.*

These coal fractions cannot be satisfactorily cleaned by "gravity" methods. With flotation remaining as the most acceptable solution, a prime consideration is that the flotation machine used must be capable of handling both coarse and fine sizes effectively. The rapid rising, dense agglomerate type "matte" coal concentrate must be removed and dewatered in large volume.

SOLUTION • No commercial flotation machine can treat both coarse and fine sizes so effectively as the Denver "Sub-A." This selective feature plus its extreme mechanical and metallurgical flexibility makes it the logical choice for coal cleaning work.

Removal and dewatering of the dense agglomerated "matte" concentrate was accomplished with special "deep-digging" punched plate rakes which carry the 7"-8" coal matte up the spitzkasten allowing surplus water to drain back in the pulp through the perforated rakes. Further dewatering is carried out in a wedge bar compression screw conveyor. Surplus water returns via middling feed pipe to the Denver "Sub-A" Flotation cell for re-use, thus eliminating surplus slurry water.

	SCREEN SIZE, MESH	FEED		CLEANED COAL		REFUSE		DISTRIBUTION, %		Reagents, lbs. per ton feed
		Weight, percent	Ash, 1* percent	Weight, percent	Ash, 1* percent	Weight, percent	Ash, 1* percent	Cleaned Coal	Refuse	
MINE I *	10 to 14	18.8	11.9	23.0	6.2	9.1	31.6	77.6	22.4	Kerosene, 3.27
	14 to 35	51.4	19.1	56.0	7.6	31.9	65.3	80.1	19.9	B-23 Frother, 0.24
	35 to 100	23.3	40.3	17.0	13.4	35.6	81.8	60.7	39.3	Pine Oil, 0.11
	Through 100	6.5	58.3	4.0	19.3	23.4	84.0	39.7	60.3	
	Composite through 10	100.0	25.2	100.0	8.7	100.0	72.5	74.1	25.9	
MINE II *	10 to 35	64.2	10.5	58.2	3.4	54.0	50.7	85.0	15.0	Kerosene, 3.46
	35 to 100	22.6	10.5	26.9	4.6	22.2	66.2	90.4	9.6	B-23 Frother, 0.26
	Through 100	13.2	12.8	14.9	6.3	23.8	64.8	88.9	11.1	Pine Oil, 0.20
	Composite through 10	100.0	10.8	100.0	4.2	100.0	57.5	87.6	12.4	

1*—Moisture free basis

CONSULT WITH YOUR DENVER "FLOTATION ENGINEERS"

"The firm that makes its friends happier, healthier and wealthier"

DENVER EQUIPMENT COMPANY
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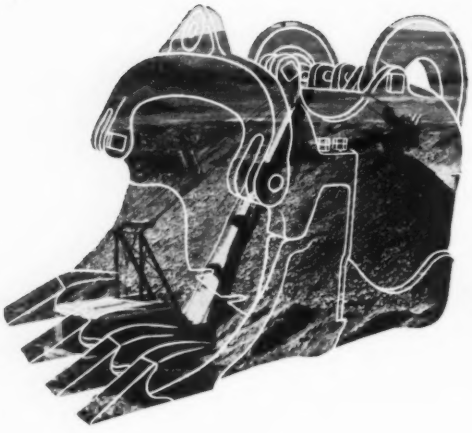
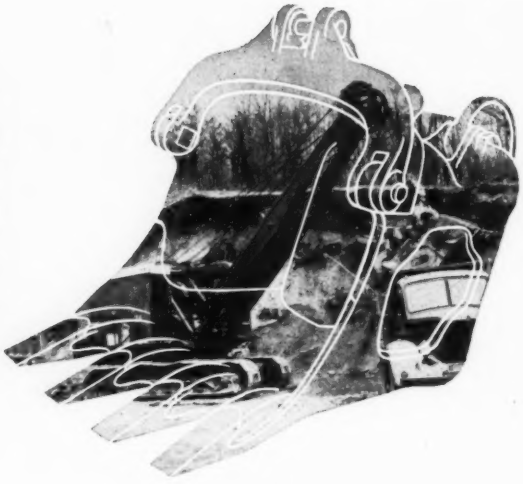
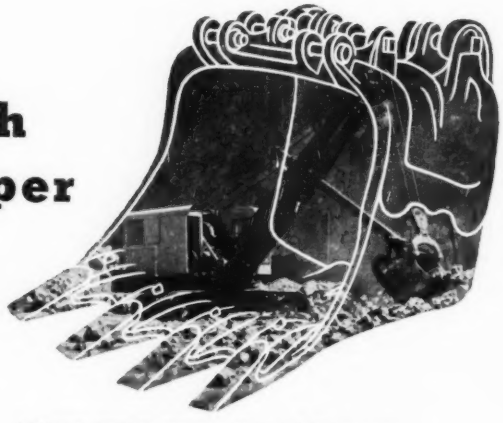




A Good Shovel Works Better with an Amsco Dipper



Made of austenitic manganese steel for resistance to impact, pressure, and abrasion, Amsco dippers also provide the advantages of fast, full loading and quick, complete dumping. Design of Amsco dippers is based on an experience of forty years in fields of power shovel application. To make a good shovel work better, specify an Amsco dipper. Available in all standard capacities, up to ten cubic yards . . . and in types as outlined below.

AMSCO RENEWABLE LIP DIPPER

A strong, long-life dipper, designed for low overall cost. Patented Amsco construction makes it possible to replace worn lip quickly, holding down-time to a minimum. Teeth are also renewable and reversible.

AMSCO WELDED TYPE DIPPER

Designed to meet the demand for a strong durable dipper at minimum weight . . . for fast digging and economical use of power. Built in two types: Two Part (1½ to 2 yards) and Four Part (2 yards and up); sections are joined by Amsco's patented plug welding process, with all joints overlapped for rigidity. Teeth reversible for double duty . . . and replaceable.

AMSCO DIPPERS for Special Purposes

AMSCO manufactures the famous Missabe Dippers and a wide range of cast manganese steel dippers and buckets for pull-shovels and underground work . . . as well as dippers of any design to meet any particular application.

AMSCO PARTS

AMSCO supplies cast manganese steel dipper and shovel parts, including: teeth, renewable lips, bails, racks and pinions, sheaves, gears, crawler parts . . . as well as a complete line of welding products for hardfacing and reclamation.

For full information on Amsco Dippers and parts—write for Bulletin 547-DS.

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AMERICAN MANGANESE STEEL DIVISION
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Inside Reasons Why...

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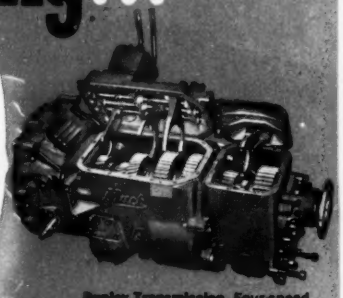
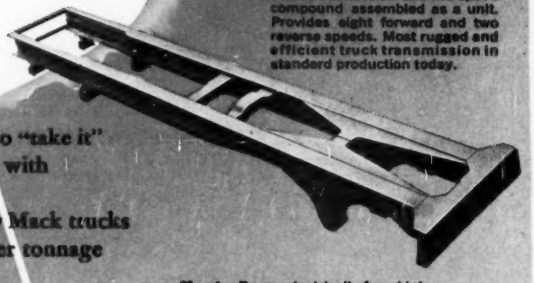
Take Out Bigger Payloads
Bring In Bigger Profits



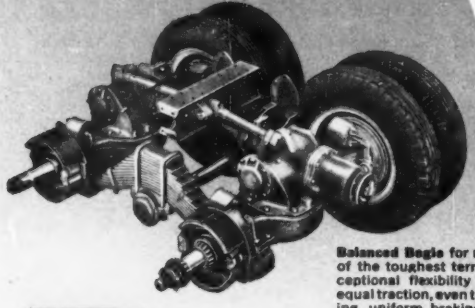
Duplex Transmission. Four-speed main transmission and two-speed compound assembled as a unit. Provides eight forward and two reverse speeds. Most rugged and efficient truck transmission in standard production today.



• In every part, Mack trucks are built to "take it" when it comes to taking out bigger loads with utmost economy!

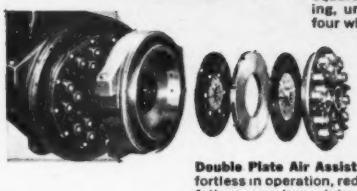
Here are some of the "inside reasons" why Mack trucks build profits for you by hauling bigger tonnage on faster, uninterrupted schedules.

Massive Frame electrically fused into single unit. Alloy-steel I-beam side members are reinforced and braced by huge cross members. Capable of carrying great loads and standing up under tremendous shock.



Balanced Bogie for mastery of the toughest terrain. Exceptional flexibility insures equal traction, even tire loading, uniform braking on all four wheels.

Exclusive Power Divider. Delivers torque proportionately to wheels having the most traction. Eliminates dissipation of power in useless slippage and wasteful wheel spinning.



Double Plate Air Assist Clutch. Effortless in operation, reduces driver fatigue, requires minimum maintenance throughout its long life.

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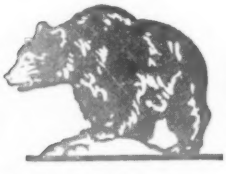
Flotation from the beginning—from bulk oil through the froth method and Xanthates; elementary principles of Froth Flotation, and a broad, clearly discussed treatment of modern processes and reagents—these and other related subjects, including uses and applications of Bear Brand Xanthates, are covered in the newly issued booklet, "Flotation Fundamentals". A copy will be mailed upon request.

BEAR BRAND  XANTHATES

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WORLD MINING

The International Department of MINING WORLD

SAN FRANCISCO, CALIFORNIA — JUNE, 1949

INTERNATIONAL PANORAMA

LONDON—Continued decline of American base metal prices met head-on with the rigidly controlled Government-fixed prices established by the British to cause the demand for the reopening of the London Metal Exchange to enable traders to recover losses such as they are sustaining now.

NEW YORK—At press time, the price of nonferrous metals stood as follows: Lead, 14 cents; zinc, 12 cents, East St. Louis quotation; copper, 18 cents. Sales at these prices have been slow. The last cut in prices made a total of five reductions for lead, six for zinc and five for copper. Results of the decline in prices were felt in the shutdown of marginal zinc operations in the Tri-State district and the Calumet & Hecla Consolidated Copper Company in Michigan.

NORTHERN RHODESIA—Rhokana Corporation, a British cobalt-producing company, has been granted $550,000 in E. C. A. aid to develop production of cobalt. The U. S. gets a five-year option to purchase 10 percent of the production for stockpiling.

MONTANA—The Anaconda Copper Mining Company recently announced the allotment of $1,800,000 to expand the Great Falls reduction works by the addition of a copper casting plant and a ninth complete unit in the zinc plant. The plant, already the largest in the world, has eight units in operation.

NEWFOUNDLAND—The announced discovery of a new zinc-lead-copper orebody indicating the extension of the life of the Buchans Mining Company's activities for eight to ten years is being followed up by the launching of a $2,000,000 development program.

MINNESOTA—The Inter-State Iron Company's Grant mine at Buhl is the latest to plan the installation of a Western Machinery Company heavy media separation plant of about 100 tons per hour capacity. The plant will be used to treat ore that cannot be handled by the present washing plant.

YUKON TERRITORY—United Keno Hill Mines, Ltd., operating in the Mayo district, recently announced plans for the construction of a $1,000,000 hydroelectric power plant. Two years will be required for the plant's completion.

BRITISH COLUMBIA—According to a recent announcement, The Consolidated Mining and Smelting Company of Canada, Ltd., will spend $12,000,000 on the modernization of its lead smelter at Tadanac, a suburb of Trail.

KENTUCKY—David P. Reynolds, vice-president and general sales manager of the Reynolds Metals Company, Louisville, has announced the company's purchase of a government-owned aluminum extrusion plant at Grand Rapids, Michigan. The plant has an annual rated capacity of 10,800,000 pounds of aluminum, and peak production is expected by August or September.

COLORADO—The U. S. Vanadium Corporation and Atomic Energy Commission have signed a contract calling for the rehabilitation and operation of the corporation's uranium-vanadium plant at Uravan. Expected to be in operation by the end of the year, the Uravan plant will be the fifth of its kind for the treatment of uranium-bearing minerals on the Colorado-Utah plateau.

FRANCE—THE E. C. A. Mission to France has announced that the French aluminum industry will receive $2,400,000 to purchase equipment for the production of aluminum foil. With this financial assistance, production is expected to be increased to 4,000 tons or 1,000 tons more than the current domestic needs.

BRAZIL—A giant project, involving construction of new iron plants, electrical railroads and piers in Espirito Santo and Rio, is to be undertaken in order to increase production and consequent exportation of manganese.

BRITISH GUIANA—A new Anglo-Canadian company, Plantation Bauxite Company, Ltd., has been organized in Georgetown for the purpose of exploiting extensive bauxite deposits on the west bank of the Demerara River.

MEXICO CITY—The Mexican Mining Chamber estimates that the decline in base metal prices has cost the Mexican mining industry some 280,000,000 pesos ($40,000,000) since last spring to the present. The Chamber further estimates the 1949 losses on lead, zinc and copper at around 380,000,000 pesos, which will be an excessive blow because of the continued high wages and freight rates.

NEW YORK—The platinum market has been exhibiting uneasiness and the metal is now commanding a price of approximately $72 an ounce.

INDIA—Decreased supplies of manganese ore from India as a result of the difficult transportation situation continues to perplex users of the metal.

French-Brazilian Groups Make Phosphate Deal

An agreement was signed recently in Paris between a French group, Comptoir de Phosphates de l'Afrique du Nord, and Brazilian interests, calling for a huge phosphate project for Brazil.

The French interests involved in the deal control the whole phosphate production in Morocco, Algiers and Tunis and sell about 6,000,000 tons of phosphates annually for use as fertilizers. Under this new international agreement, these phosphates will be offered to the Brazilian market at reasonable prices, said to be much lower than those at present.

Also, the agreement provides for the visits of Brazilian technicians at French laboratories and factories. While Brazil is not in a position to supply its own raw material, the French group will furnish the phosphate for Brazilian plants. International freight service will be available and modern machinery installed in Brazil.

The first plant to be constructed in Sao Paulo will produce 50,000 tons annually.

Rhodesian Cobalt Firm Gets $550,000 ECA Aid

The huge Rhokana Corporation in Northern Rhodesia has received $550 thousand in E.C.A. aid which will be used to assist in stimulating its production of cobalt.

The dollars were necessary to enable the company to purchase machinery only obtainable in America and do not signify any American financial interest in the group. The United States, the world's largest consumer and smallest producer of cobalt, has a five year option to purchase 10 percent of the mine's output, however, as part of its stockpiling program.

Rhokana will use an electrolytic process in its cobalt production and expects to nearly double its present output of 362 tons.

British Budget Favorable To London Mining Firms

The British budget, introduced in April by Sir Stafford Cripps, showed at least one favorable trend from the ordained austerity in that it furnished relief to the mining community, par-

A-6 100 hp

HR-4 110 hp

H-6 150 hp

HR-6 165 hp

HS-6 200 hp

NH-6 200 hp

HRS-6 225 hp

L-6 250 hp

NHS-6 275 hp

NHRS-6 300 hp

NVH-12 400 hp

NVHS-12 550 hp

5 New CUMMINS DIESELS

1. **HR-400**—110 hp (max.), at 1800 rpm. 5⅛" bore, 6" stroke.
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4. **NVH-12**—400 hp (max.), at 2100 rpm. 5⅛" bore, 6" stroke.
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WORLD MINING

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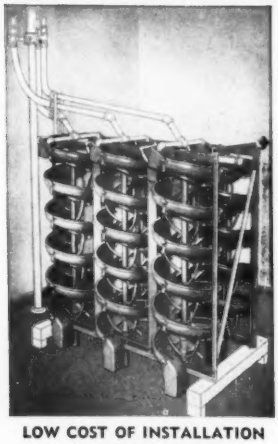
HUMPHREYS SPIRAL CONCENTRATOR



LOW COST OF INSTALLATION
NO MOVING PARTS
LOW OPERATING COST

Engineering Division

The Humphreys Investment Co.
907 First National Bank Building
DENVER 2, COLORADO

ticularly those companies registered in London.

The Chancellor announced that he would accept the principle of depletion allowances against taxation in seeking mineral and oil deposits. Until this announcement, no tax relief could be claimed against capital spent on acquiring specific mineral rights. This penalized British-registered companies very heavily when they were competing with American and foreign interests who were allowed a tax rebate on finances thus expended.

This concession and various additional encouraging trends may mark the beginning of London's return to her old status as center of the world for companies requiring financing for mineral investigation or mining operations.

The new depletion allowance, however, will aid only British-controlled companies. Colonial firms, operating in Africa and Malaya, will stand to gain, as will London registered companies in Australia, such as the Lake View and Star.

Rolling Stock Shortage Relieved in South Africa

Export figures for January and February show effectiveness of the measures taken by the South African Railways Administration to relieve the shortage of rolling stock which had hampered the activities of the important dollar-earning manganese and chrome industries last year.

The tonnage of manganese ore shipped from Durban in January and February was 47,000 and 38,735, respectively. While the figures are not yet known for chrome, which is shipped from Lourenco Marques in Portuguese East Africa, it is known that the tonnages were considerably larger than in the previous two months.

The measures taken to relieve the situation are, firstly, a high priority in railway car allocations to manganese and chrome producers, and, secondly, successful negotiations for increased supplies of steel from the United States to Canada for the completion of contracts for the supply of rolling stock to South Africa.

Anaconda Building New Ferromanganese Furnaces

Production of commercial ferromanganese from low-grade manganese ore is now being carried out by the Anaconda Mining Company at its Anaconda, Montana reduction works.

Actual production began in February when the first in a series of electric furnaces was placed in operation. Since then two more furnaces have been placed in operation, and a fourth is expected to be completed this summer. A similar furnace which has provided operational data for the new ones has been in production for some time at the Great Falls reduction works, bringing the ultimate total to five.

On a four-furnace basis, production of standard grade ferro-manganese, containing about 80 percent manganese, is estimated at 1,792 long tons per month, or 2,240 long tons when the furnace, now under construction at Anaconda, is completed.

Production starts with the mining of manganese carbonate ore at Butte. At Anaconda, concentration raises the manganese grade and removes the zinc and lead sulphides. The concentrates are then fed to a 270' rotary kiln which produces manganese oxide nodules, averaging 60 percent manganese. The required portion of the nodule production enters the charge for the ferro-manganese furnaces.

The additional iron is supplied from iron ore, 280 tons per month being required for four furnaces and 350 tons for five. Each furnace has three carbon electrodes, 30" in diameter and arranged in triangular pattern. They are charged from the top and tapped into ladles at regular intervals. Finally, the slag is decanted off and the metal poured into tray molds.

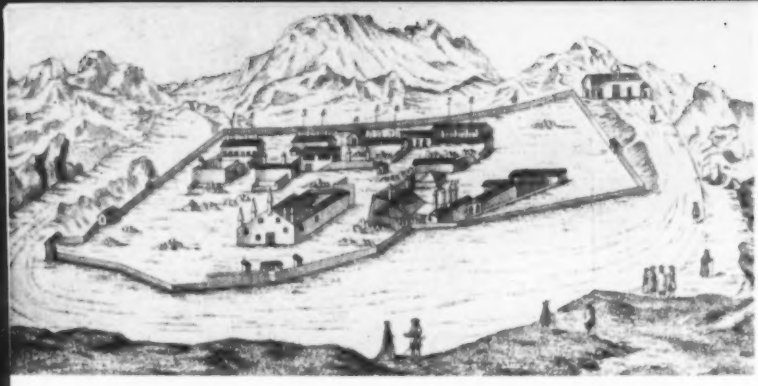
More Manganese Sought by U. S. For Steel Industry

With about 1,546,000 tons of manganese ore needed for the United States' steelmaking industry this year, an all-out effort is being made to develop new sources of this vital material.

American aid is being given to South African mines; imports from India have been boosted, and arrangements are being made to increase exports from Brazil. In addition, the manganese ore export potentiality of Morocco and the Gold Coast is expanding, with the aid of E.C.A.

About 90 percent of the United States' total requirements is normally purchased from foreign countries, with shipments from Russia in recent years totaling about one-fourth of this amount.

High-grade manganese is included in the stock-piling program, and although the size of the reserve may be confidential, it is said that if Russia suspended shipments entirely, the government would be in a position to make up this deficiency for a period up to five years.



The stockade surrounding the distillation furnaces of Almaden in 1717. A reproduction from an old cut of the period.

By Laureano Menendez y Puget

THE RICHES OF ALMADEN

Long one of the world's prime sources of quicksilver, Almaden will continue to provide mercury at a steady rate for many decades

The mercury mines of Almaden, Spain, richest in the world, are the subject of this excellent paper, a free translation from the Spanish. As the mines and their environs are so rich in history, dating back a number of millennia, an exception is made to the rule of MINING WORLD not dealing in history because truly this is history in its most accurate usage. The paper is timely and shows that Almaden can produce quicksilver in quantity for many years. The presentation will be in three parts of which this is the first.—Ed.

PART I

History and Early Development

Almaden is in the Province of Ciudad Real in a territory composed of old Betica, which lies between the mountainous walls of the Sierra Nevada, the Marianicos Mountains and the Sierra Morena. It is supposed that in the remote times of antiquity, the town was the Sisapo cited by Pliny and Estrabon. More fundamentally, however, the old Sisapo was in the town of Chillon where the mine of Valdeazogues is situated near the river of the same name. The word *sisapo* is Celtic and signifies "mine," for it is believed that the first exploiters of Almaden's mines were the Celts. It is also supposed that the Phoenicians knew and beneficiated its rich minerals, but there is no written testimony.

The first excavations at Almaden took place some time during or at the end of the Punic Wars, some 150 years before the Christian era, according to deductions from the chronicles of Celio Rodigimio. In his chronicles, the author showed great esteem for the cinnabar of Almaden, confirming the reports of Pliny that cinnabar was carried to Rome from the Sisapo, which was the only region knowr in the world to contain the valuable mineral. The cinnabar was transported to Rome, with shipments sometimes reaching a weight of 10,000 pounds.

In Rome, the mineral was reduced to vermilion which was used in the decoration of the Roman villas and in the manufacture of rouges and beauty products worn by the Roman patricians. According to the testimonies of Pliny, metallic mercury was also obtained from a bowl of the mineral that contained native quicksilver. In those remote times, the State did not exploit the mines directly but leased them on a rental basis. The lessees' principal adversaries were the smugglers who threw on the market a great quantity of vermilion at prices exceeding those fixed by the Emperor.

During successive centuries, an epoch of great turbulence in Spain, exploitation was evidently continued by the Roman invaders and later by the Visigoths, although there are no documents that confirm this supposition.

Laureano Menendez y Puget and his son, Gerardo Menendez de la Puente.

The Arab Domination

The year 714 saw the beginning of the Arab domination during which the mines came to form part of the patrimony of the Caliphs. The warlike Arabs, occupied in consolidating their conquest, were not miners, but there is no doubt that they too exploited the mines, leaving as testimonies of their occupation the following words: *Al-mahden*, which means "the mine"; *azogue* or "quick-silver," from which the Arabs derived *azoe* or "nitrogen"; *xabeca, aludel,* meaning "subliming pots or condensers," and *alarife* used to designate "mine mason." These words are still used at Almaden.

The Arabs beneficiated the cinnabar, obtaining mercury in appreciable quantities which they employed in the manufacture of cosmetics and pharmaceuticals. Another evidence of Almaden was seen in Cordova at the famous palace of Medina Zahara where a jasper fountain spewed a jet of mercury to divert the leisure hours of the beautiful Sultana.

The Order of Calatrava

Alphonso VII, upon conquering the people of this region in 1051, took possession of Almaden which was then ceded to the Knights Templar. As they were not able to defend it from the continuous attacks of the Arabs, Almaden was returned to King Sancho III, who ceded the region to the Order of Calatrava created by him during his reign. The Order was in power until 1348 when it was ordained that all the mines and minerals were the property of the king. This was confirmed by the Law of Mines decreed by Don Juan I in Briviesca, and the kings became the owners of the mines which were still administered

by the Order. Finally in 1492, the Catholic kings confirmed in Sevilla the right of Almaden to be called a town.

In 1512, when the benefits of the Military Orders of Corona were incorporated, the treasury attached the income of Almaden which was some 500 quintales (23,000 kilograms) of mercury up to 1525.

The Fuggars

Finally an era of great importance arrived at Almaden, marking the beginning of sustained exploitation. The Emperor Carlos Juan, who had received a loan of 200,000 ducats from the Amsterdam bankers, Jaime and Marcos Fuggar, ceded Almaden to them, which they exploited from 1525 to 1645, with the obligation of delivering 4,500 quintales of mercury annually.

The old mercury storehouse about 1925, later replaced with a much more substantial building, housed in its day millions of pounds of quicksilver.

First Mine Superintendent

The contract with the Fuggars ended in 1645, and the public treasury began exploiting the mine. This gave rise to the proposal of Don Juan Bustamente that retorts be constructed, with some modifications, along the lines of those employed by Saavedra Barba in Huancavelica, Peru. During 1646 nine retorts were built, and in view of the good results, Bustamente, Knight of Santiago, was named superintendent. He was the first to claim this title, and in 1651 he was sent to Peru as the Magistrate of Cuzco.

From 1646 to the turn of the century, production averaged 2,527 quintales annually. In 1700, the output began to increase, reaching 7,000 quintales and remaining at this figure until 1755. On the latter date, a fire originated in the mine that lasted a number of years and forced mining on the extension of the veins which are being worked today. It was at this time that Superintendent Don Enrique Stoor founded the School of Mine Foremen which later became the first School of Mining Engineers in Spain.

New Mining System

At the end of the 18th Century, Don Diego de Larranaga was named Director of Mines and established the mining system that carries his name. From this time until 1918, the Administrative Council of the Mines of Almaden and Arrayanes was evolved to govern the exploitation of the mines with the sanction of the Minister of the Treasury.

Dating from the year 1499, from which we have trustworthy data, until today, there has been produced some 7,000,000 flasks of mercury, representing 3,000,000 tons of mineral won from the workings of Almaden. And despite the prolonged exploitation, there remain quantities of mercury sufficient to supply the world market for a great many years to come.

A view of present-day Almaden. It is a modern town with well-constructed workers' quarters, a number of which are shown in the foreground.

One of the Bustamente furnaces dating from 1646. Efficient for their time, this example is preserved as an historical relic.

The Town of Almaden

These two millennia of continuous mining have seen the growth of a town of about 15,000 inhabitants who live in an urban group between Manchega and Andaluza which extends the length of the outcroppings of the lodes. The Andalusian sun exposes the brilliance of the town's whitewashed houses, between which are magnificent detached buildings of stately architecture, such as the Miners' Hospital, the Academy, and the General Office. The permanence of this mining town astounded Evans Bennet, Minerals Attache to the American Embassy in Madrid, when in 1945 he visited the mines. Unlike fly-by-night mining camps, Almaden has persisted and will continue to do so for a number of centuries.

Description of the Deposit

The Almaden concession, which embraces 196,000 hectares, is round and corresponds to a circle whose radius is about 25 kilometers from the center of the main shaft. Out of this entire area, mining now is carried on for a length of scarcely 400 meters. Until the end of the past century, mines under development included the Almadenejos, Entredicho and Valdeazogues, the latter being 18 kilometers from the main shaft. Manifestations of cinnabar veins persist, however, in many places a considerable distance from the shaft.

Vein Systems

Now being exploited are parallel veins that are practically vertical. The direction of these veins is W-NW and E-SW, and, as a consequence of faulting, some take an E-W direction. After passing through the fault near the San Aquilino shaft, these veins in the western part tend to unite and do,

This building, constructed to replace the old mercury storehouse, is characteristic of the type of construction employed at Almaden and shows the permanent style favored by the present administration.

in effect, in the lower levels. The western-most vein is called the San Pedro and San Diego, with a width from eight to 12 meters according to depth, and the wall rock is made up of Silurian quartzite, very porous and impregnated with cinnabar. Adjacent is found a capping of black chalk, somewhat clay-like in character, in contact with the quartzite. To the north of this vein and separated from it by a pyritic capping of chalk, probably 15 meters in thickness, is the San Francisco vein, formed of a very dark and compact quartzite like that of the San Pedro, but with less mineralization. The width of the San Francisco is four meters.

Rich Ores

Some four meters to the north and separated from the San Francisco by chalk is found the San Nicolas vein which has similar characteristics. To the north of San Nicolas, soft, sandy, black slate and carbonates with glazed facies and slipping stiae give evidence of movements of the Alpine epoch as well as the faults and throws originated in sedimentary rocks. Regularity has not exhibited itself in the tenor or widths of the veins during mining; however, the richest ore, averaging as high as 70 percent mercury, was encountered in the upper levels of the San Francisco. Today, the richest ore is found in the lower levels of the San Diego vein, although the San Francisco still claims rich ore in the central part of the lower horizons. In the upper levels, the San Pedro and San Diego, or western prolongation of the San Pedro vein, was of lesser thickness, although it approached 12 meters in width on the 13th.

The strikes of the veins are distinct on the various levels, depending on the dips of the faults that limit them on the east and west. Development, which had reached 285 meters on the 10th level at the beginning of the century, today is down to 385 meters on the 14th.

Genesis

According to the opinion of eminent geologists, it appears undeniable that the genesis of these veins is tied to the action of alkaline thermal waters that carried double sulphides of mercury and sodium in solution, sulphides that have been precipitated by the reducing action of hydrocarbons, alone or combined with the cooling of the waters, and perhaps by saturation.

The intervention of hydrocarbons in the depositing of the sulphide of mercury is proved in the greater part of the mercury deposits of the world. This is demonstrated in Siele, Idria, Huancavelica and Asturias as well as at Almaden by the presence of carbon in the soft sandy shales with monograptus, which serve as a roof for the deposit, and by the coloration of the quartzites and aspects of carbonaceous substances in the minerals.

It is observed by megascopic examination that the cinnabar has been deposited in the hair lines and fissures of the quartzites crossing the plains of fracture and penetrating between the grains of quartz that constitute the enclosing rock where there has been easy circulation of the dissolved sulphides. Consequently, the mineralization is directly proportional to the porosity of the rock and, in effect, the richest vein, the San Pedro and San Diego, is composed of coarse-grained permeable sandstone. Even fusions of the mineral have the aspect of a true sponge.

The formation of the deposits is tentatively placed at the end of the Tertiary epoch, coinciding with the ultimate Alpine movements. During this period, manifestations of geysers and hydrothermal springs gave rise to the formation of these deposits as well as the galena and other metallic sulphides that surround Almaden.

Long-Idle Minn. Mines Now Shipping Iron Ore

Shipments of iron ore are now going out from two long-idle mines, the Canton near Biwabik, Minnesota, and the Gilbert-Schley near Gilbert, Minnesota. The Canton had been idle for 50 years and the Gilbert-Schley for 35 when the Oliver Iron Mining Company undertook to return them to production.

Both mines will utilize truck haulage to bring the ore from the shovels to the facilities for loading into railroad cars. At the Canton, a temporary loading pocket will be utilized for depositing the ore from the trucks, while at the Gilbert a 400′ conveyor belt will be used to transfer the ore from the truck unloading station to the shipping pocket.

Ore mined at the Gilbert is brought by trucks to a receiving pocket in the pit from the ore which is discharged onto a vibrating screen which sizes the material to approximately six in. The fine ore material falls directly through the vibrating screen to the belt, while the over-size material must be crushed and then deposited on the belt.

The majority of equipment being used at the Gilbert was transferred by Oliver from its operations at the Morris mine at Hibbing and remodeled to suit the particular conditions at Gilbert.

Australian Gold Output Down—Dollar Imports Cut

Gold production in Australia is showing a continued slump, with the 1948 yield 46 percent below the 1939 output and considerably lower than the 1947 figures. Last year, Australia produced a total of 888,429 fine ozs. This compared with a 1947 production of 937,654 ozs.

Indicative of this decline is Western Australia which shows a steady decline. January's production in 1948 was 50,869 fine ozs., compared with 54,829 ozs. in January of the preceding year; however, it is reported, the Federal Government seems disinclined to help or appreciate the importance of the industry in Western Australia or any other of the states. Last year, only 11,613 Australians were employed in the gold mining industry.

Meanwhile, the Government has issued instructions to a committee to explore every avenue to effect further economies in dollar imports, as there will be a substantial dollar deficit in 1948-1949. Any cuts will apply to the licensing year which commenced in April.

One of the dredge man's best friends, the rig for grinding the eyes of buckets after welding in action at Asnazu. Designed and constructed by the local staff, the machine is being used to ream out the eye of a Taylor-Wharton bucket.

By G. B. Wood
San Francisco, California

LIFE FOR COLOMBIA'S DREDGES

How reconditioning of dredge parts by use of nickel-manganese welding rod permits lower cost operation and prolongs life of bucket lines

The use of nickel-manganese steel welding rod as a medium for relipping dredge bucket lips and reconditioning other parts of the bucket line and digging ladder is described in this article. First-hand information on actual operating conditions, coupled with field practice in applying welding rod, is incorporated. Valuable data are contained that many find application in other dredging areas. Not to be overlooked is the possible acceptance of the method described, or modifications of it, by other branches of the mining industry.—Ed.

The principal placer mining areas of Colombia that are operating today are along the Nechi River, in the Department of Antioquia, with the old town of Zaragoza as an approximate center. Two companies of the Placer Development group, Pato Consolidated Gold Dredging, Limited, and Nechi Consolidated, Limited, are operating in the area, which also includes tributaries of the Nechi, such as the Tigre and Porce rivers. Probably of equal importance are the Choco Pacifico operations in the Department of Choco on the Pacific slope, centered around the towns of Istmina and Andagoya on the San Juan River. In this area, both gold and platinum are mined.

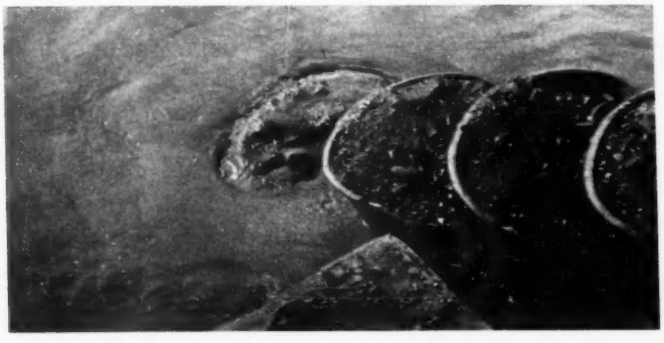
South of the City of Medellin, in the Province of Caldas, the International Mining Company is operating on the Supia River, under the name of the Supia Gold Dredging Company. The Supia is a small river tributary to the Cauca.

Turning far to the south from Supia, and following generally the valley of the Cauca River, is another property of the Placer Development group known as the Asnazu Gold Dredging Company. They are operating south of Cali in the Departments of Cauca and Valle del Cauca and the properties lie in and adjacent to the head waters of the Cauca River.

South of Cali, and below Popayan, another placer area has been recently operated by Aluviones Selectos on the Patia River. Toward the coast, in the extreme southwest of the country, in the Province of Narino, the Choco Pacifico has a dredge near the town of Barbacoas.

Considerable prospecting has been done in an area on the upper Saldana River in the Province of Tolima. The center of this area is the town of Ataco, and the last reports indicate

Tisco rivetless buckets on the dredge of the Aluviones Selectos that show the result of digging the cemented gravel by pulling away from the pockets. This is plainly demonstrated. Note the full buckets.



that this may develop eventually into one of the more important placer mining areas of the country.

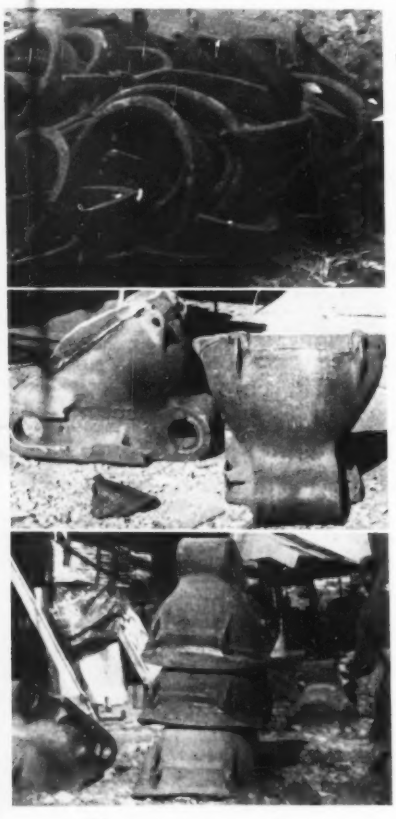
An Air-Minded Country

Visiting the various placer mining properties in Colombia requires an infinite amount of patience and at least a fair knowledge of the Spanish language. Air transport in this country has developed rapidly. The original German company that operated single motored planes out of Barranquilla was eventually supplanted by Pan American Airways which, with its subsidiaries, are now operating efficiently between most of the main cities. The local subsidiary of Pan American in Colombia is operated under the name of Avianca and there is also another independent line called Lansa, which is using converted U. S. Army C-47's on a network of local runs. This last-named company has an enviable safety record in flying this treacherous and mountainous country.

The property of the Pato Consolidated Gold Dredging, Limited, is served by its own airport, and is, therefore, easy of access. However, the other placer areas in Colombia have to be reached by automobile or narrow-gauge railroads. The roads over the mountains are somewhat primitive and, at times, dangerous, and progress is usually slow. Fairly modern automobiles, with drivers, can be hired in such cities as Medellin, Cali, and Popayan for trips to the mining areas in the immediate vicinity.

The property of the Choco Pacifico is more difficult of access, as it is impossible to go there by either railroad, automobile, or air. Some years ago Panagra operated the old Ford amphibious ships which followed the route of the San Juan River from Buenaventura to Chique-Choque. This service has been discontinued and it is now necessary to go either up the San Juan River from Buenaventura on a native river boat, or approach the property from Quibdo on the north via launch and motor truck. Both routes present certain difficulties, and the trip should be taken only by travelers who are familiar with jungle country and the Spanish language.

Top: Manganese steel lip segments in a stockpile at a Colombia dredge camp. Center: Buckets with rivetless lips welded in place ready for placing other segments. The bead of the previous weld shows plainly. Bottom: The rebuilt buckets showing the excellent job done with nickel-manganese steel welding rod at Pato. Two relippings are in evidence in this group of buckets.



River Transportation

The early transportation system followed the great rivers which cut through the mountains of Colombia in a generally north and south direction. This is still true today, as construction equipment, dredge parts, and all manner of mechanical goods and heavy freight comes up the Magdalena River and its tributaries on barges from Barranquilla. As the country developed and cities like Bogota, Manazales, Cali, and Medellin grew and prospered, narrow-gauge railroads were built from ports on the rivers to the various cities. Beside the port of Barranquilla on the north, industry—mining and agriculture—of Colombia is served from the Pacific Ocean by the port of Buenaventura, which now has modern docks and transportation facilities. A narrow-gauge railroad runs from there to Cali and to Popayan.

An Interesting History

The mining of gold in Colombia probably dates back to the very dawn of known history; yet it was not until after the arrival of the Spaniards in about 1520 that gold began to be produced in considerable volume. These early settlers from Spain landed at Cartagena, and it is believed that their first trading venture was in exchanging iron for gold on an equal weight basis. Even at this comparatively late date, it is probable that gold was the only metal known to the natives of Colombia, although there is certain evidence that they may have mined and used copper and platinum. It is not uncommon today to find gold ornaments, fish hooks, and small images on the riffles of the dredges. Many of these articles come from 50 to 60' below the surface of the ground, and the date of their origin is shrouded in mystery.

In the conquest of Colombia the Spaniards moved from the coast at Cartagena up the Magdalena, Cauca, and Nechi Rivers, and in about 1583 the town of Zaragoza was founded as the first mining and trading center in the interior of this country.

Slave Miners

The Spaniards imported slaves from Africa to work for them. This slave operation lasted in greater or lesser degree for nearly 200 years. For example, the Nechi River valley of today shows evidence of these early workings, and the main camp of Pato Consolidated Gold Dredging, Limited, is on a bench which has been washed and cut in the early days by hydraulicking.

In the early 1700's Colombia was torn by revolution and mining ceased, except for native panners. This civil unrest lasted until 1810, when the people united under Bolivar and a republic was formed, independent of Spain. Placer mining was then established to some extent on the Nechi, Porce, and Tigre rivers, and several Belgian and French companies came in with small ladder dredges having plate steel, open connected-bucket lines. One of these small units is still there, half submerged on the Nechi River and the wreckage of a second can be seen at low water on the Caceri River.

The original Pato Mines was formed in England early in 1900, and the Yuba Construction Company, now the Yuba Manufacturing Company of San Francisco, built for them their first dredge, known as Pato No. 1, in 1910. This was the first modern California-type dredge to operate in Colombia. The Nechi dredge, built by Frazier and Chalmers, in England, followed in 1917. Pato Mines ceased operations in 1934, when Pato Consolidated Gold Dredging, Limited, took over, and their expansion program was started with the building of large modern dredges.

Scope of Colombian Dredging

At present there are fifteen modern bucket ladder dredges in Colombia. Pato Consolidated has five; Choco Pacifico has five at Andagoya and one in Barbacoas; Supia one; Asnazu two; and Aluviones Selectos one. Data on these dredges are given in Table No. 1. The Pato Consolidated has one dredge under construction, a 2 cu. ft. diesel unit that is to operate on the Porce River. A second-hand dredge for Nechi Consolidated Dredging, Limited, which was moved from Emigrant, Montana, for reconstruction at New Orleans has been towed to Barranquilla, where some of the machinery was taken off to attain a four-foot draft. The hull was towed up the Magdalena to the Cauca and then to the Nechi River to the dredge site in the Santa Margarita area where installation of equipment is in progress. This dredge will be known as the Santa Margarita No. 1, and will be the first unit to operate on the property of Nechi Consolidated.

Boulders Constitute Problem

Operating conditions on the whole are not too difficult, but some departures from normal practice are noted. Two of these are worthy of some description.

At Supia, boulders running up to 20 tons are the bane of the company's existence. Experienced dredge men say this is the toughest and most difficult dredging ground they have ever seen, and they marvel that the dredge has stayed in one piece for nearly 10 years. No auxiliary equipment is employed and the boulders are worried out of place and moved aside to permit the advance of the dredge. During these years the dredge has had but two bucket lines.

The dredge of Aluviones Selectos recently worked in difficult ground that is unusually hard to dig. The bucket line is in good condition and at the time of writing no welding had been done on it. Tough digging has pulled the lips away from the sides about the pockets, but otherwise no signs of undue strain are evident.

One interesting feature of all dredging operations in Colombia is that no overburden exists. No earth-moving or stripping equipment is employed and the absence of these common adjuncts to dredging enterprises astonishes the visitor from North America dredging and placer camps.

Ever since the advent of modern dredging in Colombia, the Taylor-Wharton Iron and Steel Company has supplied the various dredges with manganese steel buckets, lips, bushings, tumblers, screen plates, and other wearing parts. The early dredge buckets, dating back to the old Pato mines period, had riveted lips. A later development was the introduction, by Taylor-Wharton, of the rivetless bucket, and these were promptly adopted by practically all dredges which were working at that time.

Reclaimed Taylor-Wharton buckets showing screen plate patches at Asnazu. This picture illustrates the neat work that can be accomplished by an experienced welder.

Contributing Factors

Increased transportation costs, plus the considerable amount of scrap loss in a worn-out rivetless lip, started the dredge operators in Colombia on experimenting with welding. The first step was the welding of a rivetless lip to the bucket hood. When this lip was worn down close to the welded joint, a cast manganese steel segment was welded on to bring the lip back to its original digging contour. Several bucket lines were treated in this manner, and the operation was so successful and such a saving resulted in the cost of maintaining the bucket lines that it was decided that for new installations an integral bucket would be supplied.

This integral unit is the same as any conventional dredge bucket except that no separate lip is provided. The cutting edge is thickened to a normal lip section for a depth of about six inches on the center line. Segments are ordered after the wear contour of the bucket has been determined, and they are welded in place when the buckets are worn down close to the thin section of the hood. A new bucket line would be ordered with about 10 percent spares.

Resegmented buckets, six at a time, are put in the line in rotation. The next six go in next to the last resegmented buckets, and so on. The difference in lip level presents no operating problem.

Bucket Life Prolonged

It might be well to elaborate here on "relipping" and "reconditioning." Further on this article will deal with welding practice in some detail, but one should have the general picture first. The managements are aiming at ten-year bucket life. A bucket is

TABLE NO. 1

Company	Dredge	Bucket Capacity	Digging Depth
Pato Consolidated	Pato No. 1-A	6.0 cu. ft.	45′
Pato Consolidated	Nechi No. 2	8.5 cu. ft.	51′
Pato Consolidated	Jobo No. 3	13.5 cu. ft.	67′
Pato Consolidated	San Francisco No. 4	13.5 cu. ft.	67′
Pato Consolidated	Boyaca No. 5	13.5 cu. ft.	86′
Supia	Supia	8.0 cu. ft.	36′
Asnazu	Asnazu No. 1	6.0 cu. ft.	32′
Asnazu	Asnazu No. 2	12.5 cu. ft.	45′
Aluviones Selectos	Selectos	10.0 cu. ft.	35′
Choco Pacifico	Choco No. 1	4.5 cu. ft.	30′
Choco Pacifico	Choco No. 2	6.5 cu. ft.	34′
Choco Pacifico	Choco No. 3	12.0 cu. ft.	42′
Choco Pacifico	Choco No. 4	8.0 cu. ft.	36′
Choco Pacifico	Marino No. 5	12.0 cu. ft.	66′
Choco Pacifico	Choco No. 6	8.0 cu. ft.	36′

relipped by segments once, and often twice before any further work is done on it. At the third relipping, the bucket is usually reconditioned. This is a fairly extensive welding operation, consisting of a renewal of the under side from the back eye up as far is necessary on the rails where there has been tumbler wear. The front eyes are brought back to a circular shape, and the pin slots are reclaimed for a tight fit on the pin lugs.

One might question such extensive welding on manganese steel, but the answer seems to be that the reclaimed buckets go back in the line, do not crack or fail in any way, and give a greatly increased life. Furthermore, there is the urge to take more than the usual chance in welding, as a dredge bucket today is an extremely expensive article by the time it has reached the dredge.

Methods Employed

In putting on a new segment the procedure, which employs a native welder and helper, is about as follows:

1. If necessary, the worn edge of the hood is shaped slightly with a gas torch so that a reasonable bearing is made with the segment.
2. The segment is lifted with a chain block and placed on the hood, then tack welded enough to hold it in place.
3. One bead is put on the outside, the next on the inside, and the work continues alternately until finished. The helper is most concerned with peening and he does it with vim and vigor, chiefly because he likes the noise he creates.
4. If segments do not fit exactly, they are bent in the press or burned off at the ends if they protrude.

The next step in reconditioning a bucket is to repair the front eyes and the bottoms. This is done in the conventional manner. The eyes are hand-ground to a pipe gage after welding. The bottoms, chiefly under the back eyes, are built up approximately level, but are not ground. Consideration is being given to rigging up an old lathe to machine the front eyes after welding.

Supplies and Costs

From 35 lbs. to 45 lbs. of rod are used to put a segment on a 13½ cu. ft. bucket. Time required to perform the job for a welder and helper is 6 to 8 hours per bucket. Taylor-Wharton have supplied their own Timang rod for this work in large quantities.

The wage scale follows:

Welder, 5.50 pesos per day.
Helper, 2.20 pesos per day.
(1 peso—57c, approximately.)

From the above the cost of relipping a bucket can easily be deduced.

Tumbler Rebuilding

Welding is also applied, to a large extent, to lower tumblers. When flanges of lower tumblers are worn, sections of worn screen plates are welded to the inside surface, bringing the flange back to approximately its original thickness and providing considerable additional life for the casting itself.

Rebuilding the big lower tumblers has, in general, been entirely successful. The last failure on any one of these was over three years ago and occurred on an old tumbler of which no service record exists.

Both treads and flanges usually wear quite thin, and no choice seems to exist between the Y-spoke and later designs. Thin flanges are reclaimed by welding on sections of old screen plates to the inside. This makes an excellent repair job and provides considerably extended life. On the smaller tumblers, screen plates also have been welded to the tread.

Eye Grinding

A great deal of repair work has been done on the bucket line of Asnazu No. 2 dredge and the records seem to indicate that only 20 buckets have been added to the original total in nearly eight years. The lips are welded in place, and the lugs burned off. Front eyes and pin slots have been built up and most of the buckets have been resurfaced under the back eyes and along the under sides of the rails. The front eyes are hand-ground to gage after welding. The procedure is much the same as that employed at Pato and the bucket line appears to be in good, sound condition, and until early 1949 only one failure had been recorded.

The master mechanic has developed a most ingenious rig, or preferably jig, for more accurate grinding of the front eyes after welding. A fixture to hold a through bar is clamped between the eyes, and the through bar is centered for pitch and parallel. On one end of the bar is mounted a small air-operated grinding wheel, the operator moving the wheel manually. When one eye is ground, the boring bar is removed and replaced in the other eye and the process repeated. Thus, there has been a big forward step in the maintenance of wearing parts on these dredges by welding, and this development is, perhaps, natural because the companies are operating at great distances from the original sources of supply and increasing costs of transportation and operation have made the developments almost necessary.

Left: An old split tread lower tumbler at Pato ready to be reclaimed by welding. Note the extremely thin flanges which denote long wear. Tumblers such as this no longer are manufactured. Right: Reclaimed lower tumbler at Pato that demonstrates the use of old screen plate segments. This part will have a long life as a result of the reconditioning.

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EUCLIDS *Move the Earth*

NEW EXPANDING TYPE ROCK BIT OFFERS REVOLUTIONARY DEPARTURE IN MINING FIELD

By Victor Karbowski
Manager
Mina Castrovirreyna, Peru

The increased rock breakage which can be obtained with explosive charges concentrated at the bottom of a drill hole is well known. A recently developed method of providing an enlarged chamber at the bottom of a standard drill hole is by use of an expanding bit. Such a method is provided in a new bit designed, developed, and put into use at the Castrovirreyna mine, Peru.

The drill consists of three parts, the head, cutting blades, and holding rivet. The arrangement and shape of the cutting blades is the result of experimentation at this mine.

Figure No. 1 shows the details of the bit capable of expanding to double diameter. This bit is used for drilling in comparatively soft rock.

Many experiments were undertaken at the Castrovirreyna mine in all types of rock and in all classes of drilling operations. To obtain a comparison with regular drifting practice two drifts were turned in opposite directions from a crosscut. The vein was hard quartz in a dense porphyry, two feet wide, impregnated with argentite, galena, and chalcopyrite. The vein was centered in the drifts and the size of the drives was four by six feet.

The following set of conditions was imposed upon the experiment:

Conventional drift—
- $\frac{7}{8}$" conventional Swedish drill steel.
- $1\frac{1}{8}$" minimum drill hole.
- 12 holes drilled 5′ 6″ deep.
- 72 cartridges, or 6 per hole, used.

Expanding bit drift—
- Expanding bits used.
- Six holes drilled with conventional steel 4′ 6″ deep.
- Expansion chambers 10″ deep, 2″ in diameter drilled. Total depth 5′ 6″.
- 42 cartridges, 7 per hole, six of which were placed in chamber.

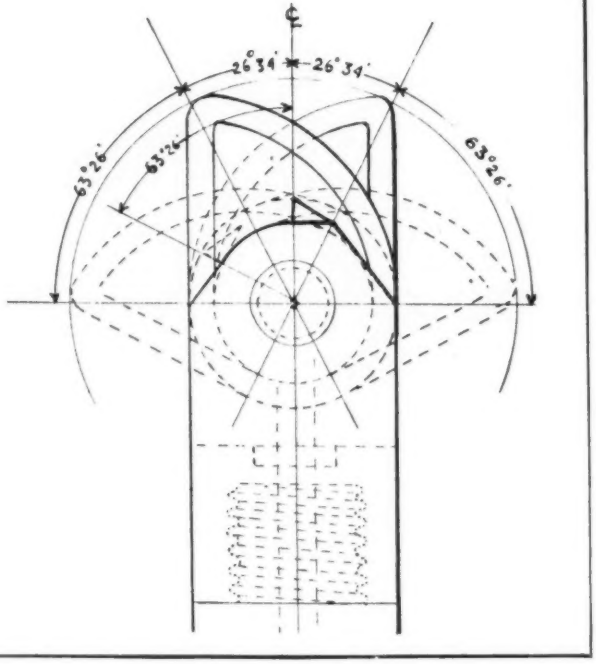
Six pairs of expansion bits were used in the work. Dynamite strength was 62 percent, size of cartridge $\frac{7}{8}$ x 8″.

A series of twelve cuts was taken in each drift. The conventional drift provided muck with much excessively fine material; the expanding bit drift had but a small percentage of fines.

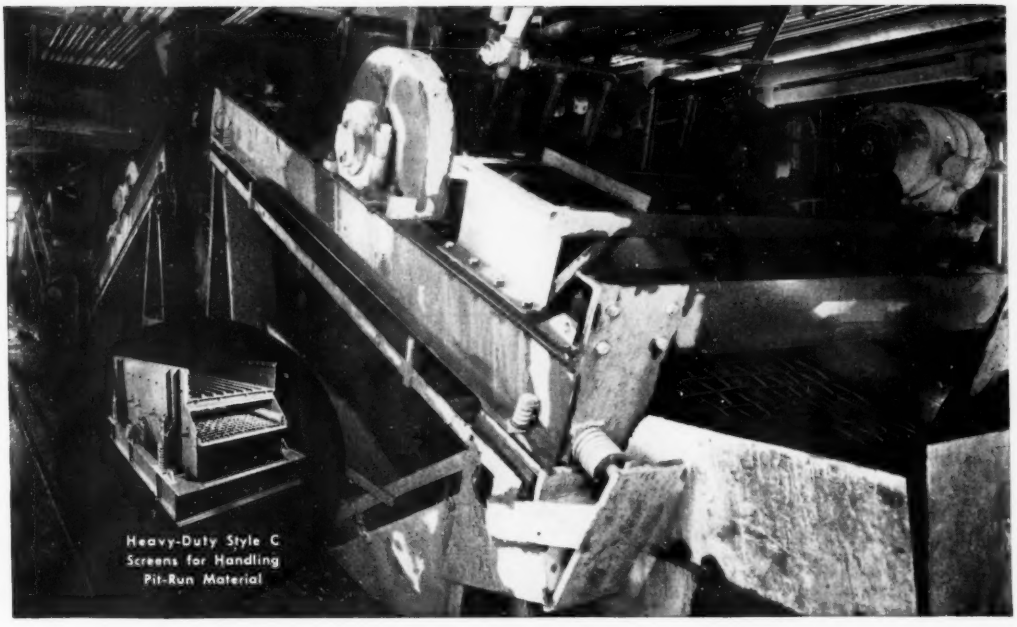
Considering direct labor cost, dynamite, and steel charges, the minimum saving in the twelve cut experiment was 26 percent in the expanding bit drift.

Although much work remains to be done to compile data for an exact comparison of costs, the results of the preliminary experimentation are so gratifying that this report is disseminated through the medium of MINING WORLD and its International Supplement, WORLD MINING.

Figure I



Photographs of $1\frac{1}{4}$" drill bits as used in tests and development work at the Castrovirreyna mine. The results were gratifying as is detailed in the accompanying article.



Screened 23 Million Tons Aggregates for Coulee Dam

WHEN GRAND COULEE DAM, one of America's greatest engineering projects was under construction in Northern Washington, this battery of heavy-duty Allis-Chalmers Style B vibrating screens was on the job 21 hours a day.

They screened *millions of tons* of pre-scalped pit-run material — sand, gravel, chunks of sharp rock as large as 6 inches . . . sometimes feed ran as high as 4,000 tons per hour.

Yes, when that job was done, 23,000,000 tons had been put through these 5 by 10 ft double deck screens! And they were by no means "finished." Farmed out to other sites, they continued their useful screen life for years.

CHECK IMPORTANT FEATURES

Performance like this is something you can expect when you specify Allis-Chalmers vibrating screens for your job. They're built of high tensile steel alloys. Screen cloth support frames are "stress-relieved" to eliminate possible strains around welds.

You choose from *five separate types* of vibrating screens — for *any* application, from pit-run scalping of 3 by 4 ft pieces to fine 35-mesh sizing.

Every A-C screen recommendation is based on a thorough analysis of operating conditions by a trained screen engineer. There is an A-C man in your area who can help you cut screening costs . . . increase capacity. Call him today. A-C offices or distributors in principal cities in the U.S. and throughout the world.

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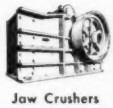
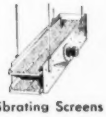
Kilns, Coolers, Dryers


Jaw Crushers

Hoists

Mills

Gyratory Crushers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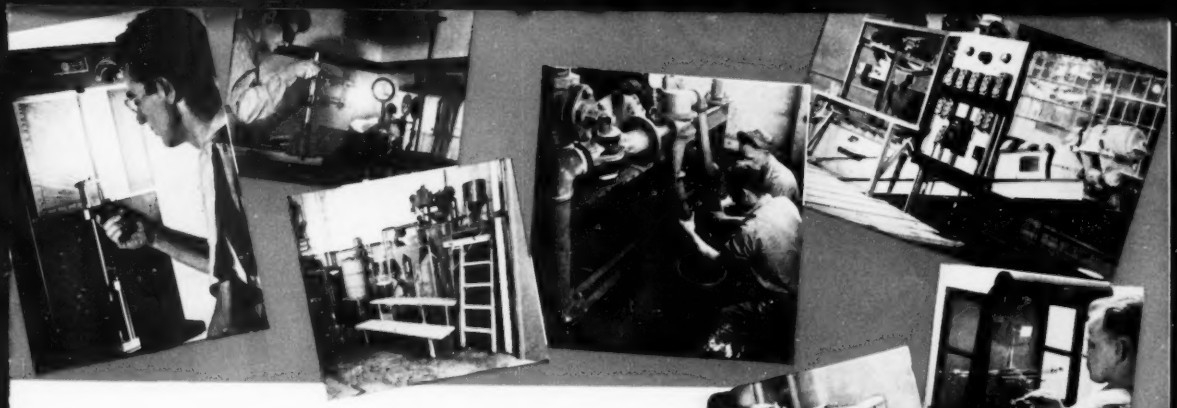
Cyanamid Mineral Dressing Laboratory started 27 years ago as a humble one-room laboratory housed on a dock at the far end of our Warners, N. J. plant. It was founded – and its expansion has always been based – on the simple principle:

Cyanamid Reagents and Processes can never be better than the testing which precedes their application on your mill.

Today, the work of the Cyanamid Mineral Dressing Laboratory is just as important "A Cyanamid Product" as a drum of Aerofloat® Reagent or Aero Brand Cyanide. Most frequently, its findings come to you as a "Cyanamid Mineral Dressing Laboratory Report."

Just what is back of that Report?

Net, a Cyanamid Mineral Dressing Report summarizes the findings of scores of metallurgists, microscopists, physicists and testing engineers who in turn can draw upon the composite experience of nearly a thousand scientists in other departments of Cyanamid. Not even a small fraction of this technical talent and facilities could be economically justified by a single mining property.

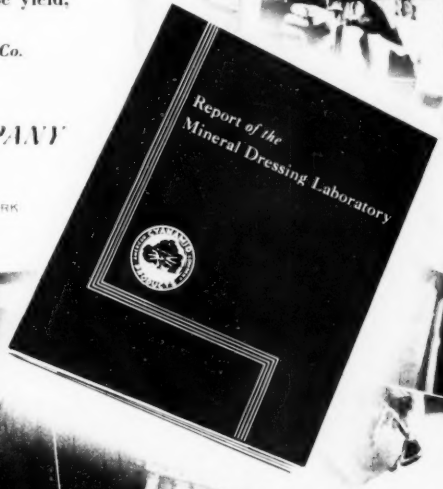


Obviously, the scope of the work going into each Cyanamid Mineral Dressing Laboratory Report differs with the specific problem. But, as the need warrants, a Report may combine the results of microscopical examination, exhaustive physical and chemical analyses; pilot plant testing by gravity, flotation, cyanidation, Heavy-Media Separation, Dutch State Mines Cyclone and various combinations of these methods. Conclusions are based on mature study and sound interpretation of the test data to evolve the most profitable flow scheme.

While ore samples tested each year number into the hundreds, they come principally from new ore bodies; from new deposits being opened on existing properties and from mills whose flow schemes must be modernized to stay economic. Frequently, however, Cyanamid Field Engineers can offer practical help right at the mill, based on previous results on an essentially parallel problem.

We invite correspondence and discussion with Cyanamid Field Engineers as to how the services of the Cyanamid Ore Dressing Laboratory can help you to increase yield, reduce cost or both.

** Aerofloat is a registered trademark of American Cyanamid Co. applied to certain flotation reagents of its manufacture.*



AMERICAN Cyanamid COMPANY

MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA NEW YORK 20, NEW YORK

Printed in U.S.A.

THE JAPANESE ANTIMONY INDUSTRY UTILIZES UNIQUE METHOD OF RECOVERING METAL

A new antimony smelting plant was completed recently at the Nakase mine in Japan for the treatment of stibnite ore, low in antimony but running quite high in silver and gold. The results are effective and it employs Herron Schmidt's principle and other unique methods to treat such ores as are mentioned above.

Ownership of the plant is vested in Nihon Seiko (Japan Concentrate) Company, Shimomiyabimachi 2, Shinjuku-ku, Tokyo, and the plant is at Sekinoyamura, Yabu-gun, Hyogo.

Methods of Treatment

Lump ore is treated by the Herron Schmidt method. The stibnite is broken down by heat, the antimony volitalized, condensed, and recovered as Sb_2O_3, after which it is reduced to metal in a reverberatory furnace.

Concentrates in the form of flotation froth are treated by a unique method of employing a flash roaster. The froth is discharged and falls down into the roaster at a temperature between 1,000 and 1,200° C., and 99 per cent of the antimony content is oxidized and volitalizes, which is a far better result than by the ordinary briquette method. Gold and silver fall to the bottom of the roaster as finely divided metal, thus affecting the separation. The roaster is heated by heavy fuel oil.

The smelter was completed in October, 1948, and was blown in at once. Although it is too early to make any conclusions about the new method, it can certainly be said that it has solved the problem of separating gold and silver from antimony. Thus, a hopeful future is predicted for the mine and the Japanese antimony industry.

Barriers to Development

The antimony industry has been suffering both from financial and technical difficulties. Financial development is owed to the government controlled price. The technical difficulties lie in smelting the low grade antimony ores which are relatively rich in gold and silver. The antimony rich ores can not be used as gold ores because the cyanide process is hindered by the presence of antimony. Neither can they be used as antimony ores alone as the grade is so low.

The effectiveness of the new method of separating the gold and silver from the antimony not only makes the utilization of such ores possible, but is of great help in raising the purity of the antimony metal.

The Only Producer

The Nakase mine has 1,000,000 tons of probable ore. Its average grade is estimated at 40 gr. per ton silver, 5 gr. per ton gold, and 1 percent antimony. Recently the mine has been producing 2,500 tons of ore per month, and this will be raised to 3,000 tons per month at the beginning of the next fiscal year (April, 1949). Silver in the amount of about 95 kilograms, approximately 14 kilograms of gold, and 23 tons of antimony will be won from 3,000 tons of ore.

The mine has been producing 80 percent of all the Japanese antimony before the war and today is the sole producer as all other mines are inactive. The mine director is Kenichi Kawaguchi and the head of the company is Zen-nosuke Miyazaki.

Estimated Demand

Japan's demand for antimony metal for the next fiscal year is estimated as follows:

Antifriction metal	600 tons
Battery plate	400 tons
Enameled iron ware	390 tons
FREON gas catalyzer	240 tons
Type metal	80 tons
Electric utilities	40 tons
Dyes	100 tons
Others	50 tons
Total	1,900 tons

Japanese production being so short, an estimate of more than 1,500 tons must be imported, preferably as ores. If the demanded quantity is imported, Nakase's new plant will be of great help to Japanese industry. If the international financial conditions allow, the company will erect more plants using the same processes and types of plants to reduce foreign ores for export as metal.

In Review

Japanese antimony production was at its height just before and at the beginning of the war, and Nakase, Ichinokawa, Tsugu, and 15 other mines and seven smelting plants were operated. However, the quantity produced from home ores was so short that in 1940 the equivalent of 2,495 tons was imported either as metal or antimony bearing ores. As the war drew nearer to the end, importation difficulties increased and some of the smelting plants were destroyed. At the end of the war, the production was almost nothing and has remained so for some time, but is now recovering some activity.

Bunker Hill to Mine Five Million Low-Grade Tons

Having worked out a huge caving system, the Bunker Hill & Sullivan Mining and Concentrating Company of Kellogg is preparing to start initial production on 5,000,000 tons of low-grade lead-zinc-silver ore from the old upper workings.

About 25 men have been employed in preliminary work, which has included short finger raises, constructing a 600′ conveyor belt system to replace mine cars and installing a giant underground crushing plant.

Since the program was initiated in March, 1946, the territory to be mined has been thoroughly sampled by crosscuts and raises. Meanwhile, the company's mill has been enlarged to handle the increased tonnage which will be treated along with the higher grade mill feed from the lower levels.

Expansion of AS&R Plant In Utah Progressing

W. J. O'Connor, manager of the American Smelting & Refining Company, Utah Division, announced recently that construction is proceeding satisfactorily on the $3.5 million anode plant, scheduled for completion by 1950.

The new development, which will adjoin the smelter's converter unit, will consist of a 147 x 450′ plant and a 300 x 25′ lean-to. In the new operation, blister copper now produced at the smelter will be melted with carbon, accompanied by air injections, and cast into anode bars.

Some 12,000 of the 23,000 tons of blister produced monthly will be utilized in this process, with the balance going to Baltimore.

Idaho Mining Association To Hold Annual Meeting

June 13, 14 and 15 are the dates set for the annual meeting of the Idaho Mining Association at Sun Valley, Idaho.

Everyone interested in mining is invited to attend, and reservations may be made through Harry W. Marsh, secretary of the association, 304 Baird Building, Boise, Idaho.

J. B. Haffner, general manager of the Bunker Hill & Sullivan Mining and Concentrating Company, is president, and A. H. Shoemaker of Hailey, Idaho, is vice-president.

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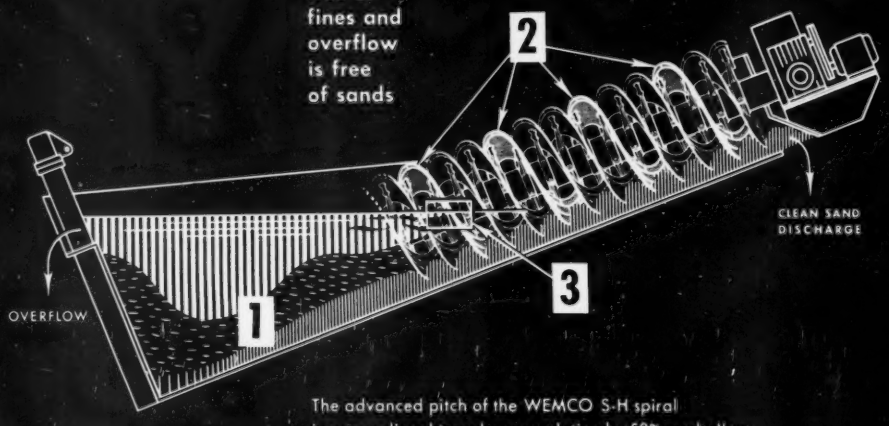
Sands are free of fines and overflow is free of sands



The advanced pitch of the WEMCO S-H spiral increases lineal travel per revolution by 50%, and allows the use of up to three spirals per shaft.

This design feature assures sharper separation in three ways:

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2 **LESS INTERFERENCE** - The increased raking capacity of the WEMCO unit is accomplished without an increase in speed of spiral rotation. Thus, undesirable agitation of the pool is prevented and there is less interference to settling and overflow.

3 **RAPID INITIAL SEPARATION** because pulp feed and sand removal are kept in balance, hence "sanding up" is prevented and coarse fractions are kept out of the pool as much as possible.

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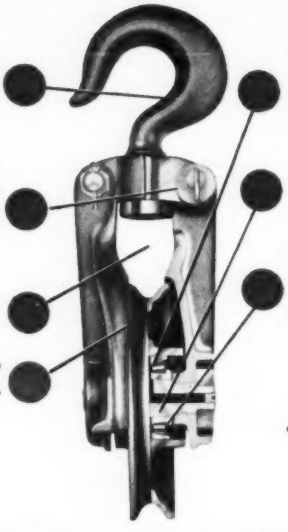
Quick-opening "snatch block" construction provides a fast, simple means of inserting or removing the wire line — no tools are needed. With toggle-pen removed side plate remains in proper position.

Wide throat will pass fittings, splices or square knots in wire line.

Sheave rims are recessed into side plates to prevent rope fouling and to reduce rope wear.



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PROMINENT MEN IN INTERNATIONAL MINING

John I. Tymchyshyn, a displaced person and native of Ukrainia, is now employed in the State mine office at Hibbing, Minnesota. A graduate of the Pribram College of Mines in Czechoslovakia, he is the first D. P. engineer to find employment on the iron range, as far as is known.

Colonel T. N. P. Curry, *C. de Bosdari* and *M. F. W. Boustred* are directors of the newly formed British Metal Corporation (South Africa) Pty. Ltd., a subsidiary of the British Metal Corporation.

L. A. Crozier recently resigned his position of mine superintendent with Compania Minera & Agricola Oploca de Bolivia, one of the Patino group, and has accepted a similar position with the Associated Mining Companies of Fiji at their Loloma mine.

Norman Edgar has been appointed manager of Misto Mines, Ltd., and is now directing exploration in the Black Lake area of Saskatchewan.

Charles Payne of the Hercules Powder Company was recently in Chile, where he surveyed the country with a view toward installing a powder plant. It is understood that a site has been selected near Serena, an excellent position from which to supply explosives to Chile's mining industry.

J. E. P. Murrie, manager of operations for the Broken Hill Associated Smelters at Port Pirie, South Australia, and *L. B. Heney*, assistant research superintendent, were recent visitors in the Coeur d'Alene mining district of Idaho, where they studied the latest development in smelting processes at the Bunker Hill & Sullivan Mining & Construction Company.

H. H. Hales has succeeded *R. C. Brehaut*, retired, as manager of Sherritt Gordon Mines, Ltd., of Canada.

Frank Hockey, Broken Hill Proprietary's general superintendent of mines and quarries, has been elected a vice-president of the Australasian Institute of Mining and Metallurgy.

Owen E. Mocatta, a partner in the gold bullion dealers, Mocatta & Goldsmid of London, has retired after more than 45 years of business activity.

Henry L. Hill has resigned as mine manager of the Reeves MacDonald Mines, Ltd., British Columbia's second largest lead-zinc producer.

C. J. Turle has resigned his position as director of the Hampton Gold Mining Areas and has been appointed a local director in Australia. *C. T. Ley* and *R. G. Clayton* also have been appointed directors of the firm.

Peter W. Leidich is currently on vacation from the Bethlehem Chile Iron Mines Company of Chile and may be addressed at 1109 Washington Street, Golden, Colorado.

J. M. Cummings, consulting mining engineer, is now associated with Wright Brothers, metallurgical engineers, with offices at 305 Credit Foncier Building, Vancouver, British Columbia.

Sir Joseph Hallsworth has retired from the National Coal Board and the British Miners Welfare Commission.

H. Hardy, Rhodesian mining engineer interested in Australian asbestos, is currently visiting that country on business.

D. McCormick has left the Mines Department, New Zealand, and is now engaged as geologist for the Australian Petroleum Company at Port Moresby, Papua.

Victor J. Creeden recently resigned as general manager of Hedley Mascot Gold Mines, Ltd., of British Columbia, with which he had been prominently identified since incorporation.

Arne Stavang and *Arne Hofseth*, engineering experts from Norway, are in the United States to study copper mining methods. They expect to spend the greater portion of their time at properties in Arizona and New Mexico.

Dr. F. K. Moss, consulting engineer to Big Bell Mines, Ltd., Western Australia, was a recent visitor of Melbourne.

Roy B. Earling, vice-president and general manager of the Alaska Department of the United States Smelting, Refining and Mining Company, recently left for Nassau, British West Indies, for a conference of company officials. Other officials present include *N. W. Rice*, *M. H. Kuryla* and *A. M. Hartford*.

Walter Waidler has been named superintendent of the Trench-Flux Unit of the American Smelting & Refining Company at Patagonia, Arizona. He was transferred from the company's operations at Vanadium, New Mexico, to succeed *Wendell T. Brown*, who will serve the company in South America as ore buyer.

Haddon King, chief geologist for the Zinc Corporation in Australia, has been in Queensland on company business.

Malcolm McGregor, president and managing director of Golden Contact Mines, Ltd., of British Columbia, left recently for McGillivray Falls with a sizeable crew to resume underground development of the firm's property.

E. F. Emmons, mine manager of Pioneer Gold Mines of British Columbia, Ltd., for many years, has been transferred to the company's Vancouver office. *H. A. Rose* is now general superintendent at the Pioneer mine.

H. H. Dunkin has been advanced to Associate Professor of Mining at the University of Melbourne, Australia.

Lic. Manuel Martinez Baez, secretary of Mexico's Ministry of National Economy, has announced the establishment of the National Institute for the Investigation of Mineral Resources, decreed by *President Miguel Aleman* to supplant the Directive Committee for the Investigation of Mineral Resources, because the latter's scope was too limited. Institute members include: *Ing. Manuel J. Zevada*, Ministry of National Economy representative; *Ing. Alfonso de la O. Carreno*, Ministry of Hydraulic Resources; *Ing. Ricardo Monges Lopez*, National University; *Ing. Antonio Manuel Amor*, Petroleos Mexicanos, the official oil company; *Ing. Gonzalo Robles*, Bank of Mexico; *Lic. Ricardo Torres Gaytan*, Nacional Financiera, the government's fiscal agency; *Ing. Ezequiel Ordonez*, impulsing and coordinating commission of scientific investigation; *Ing. Manuel Villafana*, national commission for stimulation of the mining industry, and *Ing. Rafael Illescas*, national industrial fomentation laboratories.

Chas. H. Behre, Jr., recently returned to the United States from Rangoon, where he had been discussing general plans for mineral development in his position of representative of Behre Dolbear & Company, New York. On May 15, he left to resume field work in Mexico.

R. C. McCorkell, who resigned last fall from the board of directors of Big Four Silver Mines, Ltd., has now obtained a contract to mine within the next five years a maximum 5,000 tons of ore in the Prosperity and Porter Idaho mines in British Columbia. *J. H. M. Greenwood* has replaced McCorkell as a full director.

SEND IN YOUR NEWS

Have you changed your position recently or do you have up-to-the-minute news on a mining operation in your country? If you have we would be very interested in receiving this information.

Readers of this section of WORLD MINING are interested in news of mining people and mining activities from all over the world.

Send your news to: MINING WORLD, 121 Second St., San Francisco 5, Calif.

ALASKA—Fred D. Crane and M. E. Kelly, both of Nome, are making preparations to start development of the *Cape Mountain* tin deposit, 105 miles north of Nome on the Seward Peninsula, the western-most tip of North America. The property was diamond drilled by the U. S. Bureau of Mines last year, and veins of cassiterite running about seven percent tin are said to have been uncovered last summer.

QUEBEC — June production is scheduled by the *Quemont Mining Corporation* from its property near Noranda. Construction work has been progressing satisfactorily, and a smelter contract has been signed with Noranda Mines for smelting and refining the company's copper concentrates. Another agreement will permit the sale of approximately 90 percent of the company's refined copper to the United States for stockpiling until April, 1953. Negotiations for the sale of zinc concentrates also have been completed.

ONTARIO—With present ore reserves sufficient for three years of operation, *Central Patricia Gold Mines, Ltd.* is now expanding development work at its property near Central Patricia. The program includes a second winze 450′ below the 3,400′ level which will allow three new levels to be opened.

COLORADO — Officials and engineers of the *Molybdenum Corporation of America* are reported to be examining the *Urad* molybdenum mine workings west of Empire, with a view toward establishing mining methods that would permit sufficiently large-scale production to bring costs within competitive range. At present, the Urad mill has only a 160-ton daily production. To make operation of the mine feasible, engineers say that a minimum of 1,000 tons would have to be mined and milled daily, thereby maintaining production costs equal to those of the *Climax* mine near Leadville, the world's largest molybdenum producer. The Urad ores are of higher grade but smaller proportion than the Climax ores.

MEXICO—Full recovery from the long strike last year that shut down several vital departments was announced by *Cia. Fundidora de Fierro y Acero de Monterrey, S. A.*, Monterrey, Nuevo Leon, Mexico's largest iron and steel works. Increasing demand for iron and steel, chiefly from expansion of the industrial program and rehabilitation of the government-administered National Railways, Mexico's largest railroad, accounted for the recovery. Help was also acknowledged from the 14,000,000 peso ($2,150,000) loan obtained last year from the Soc. Financiera Credito Bursatil, S. A. A 99 percent dividend was declared on 1948 profits.

NEVADA — The *United States Gypsum Company* of Spokane, Washington, will construct a $1.5 million plasterboard and wallboard plant at Gerlach, 80 miles north of Reno, according to a recent announcement. An equal amount will be spent on a housing project, electric system and other facilities, it was said. Last year, the company purchased the entire holdings of the *Pacific Portland Cement Company* at Gerlach which included a gypsum quarry, aerial tram and screening plant. Soil conditioners and other agricultural products will be produced at the new plant.

SASKATCHEWAN — A diamond drill program has been started by *Consolidated Astoria Mines, Ltd.*, at its BB group of claims adjoining Hollinger Consolidated, Noranda and Mining Corporation in the Indian Mountain Lake area. Drilling is under the direction of James McAvoy, discoverer of the base metal deposits in the area.

ONTARIO — An intensive depth program is planned for this year by *Preston East Dome Mines, Ltd.*, at its property in the Porcupine area of northern Ontario. This program, according to Mine Manager W. A. Hutchison, will be concentrated on the west porphyry, which contains more than 50 percent of the four producing orebodies' reserve.

BRITISH COLUMBIA—R. Crowe-Swords, president of Santiago Mines, Ltd., reports that $200 thousand will be spent by Eastern interests on further exploration and development of the *Silversmith* mines group at Sandon which he controls. First work will be rehabilitation of the 150-ton mill; the power plant is in good condition. A fair tonnage of mill feed is said to be available as soon as weather conditions permit active operations.

NORTHWEST TERRITORIES—*Vanacor Gold Mines, Ltd.*, a Vancouver company, has acquired the *Dod* group of five uranium-bearing claims which constitute 200 acres on Great Slave Lake. Active preliminary prospecting, which would include stripping, trenching, test-pitting and making a thorough survey with a Geiger-Mueller counter, is planned before the spring break-up.

MEXICO—*Cia. Minera y Exploradora de Guanajuato, S. A.*, operating in the Guanajuato City sector of Guanajuato, was recently summoned before Secretary of Labor Lic. Manuel Ramirez Vazquez in connection with back pay and other demands of its workers, totaling about 500,000 pesos ($81 thousand). In answer to these demands, the company said that progressive economic benefits for its workers, members of Section 154 of the National Miners Union, have nearly driven it into bankruptcy.

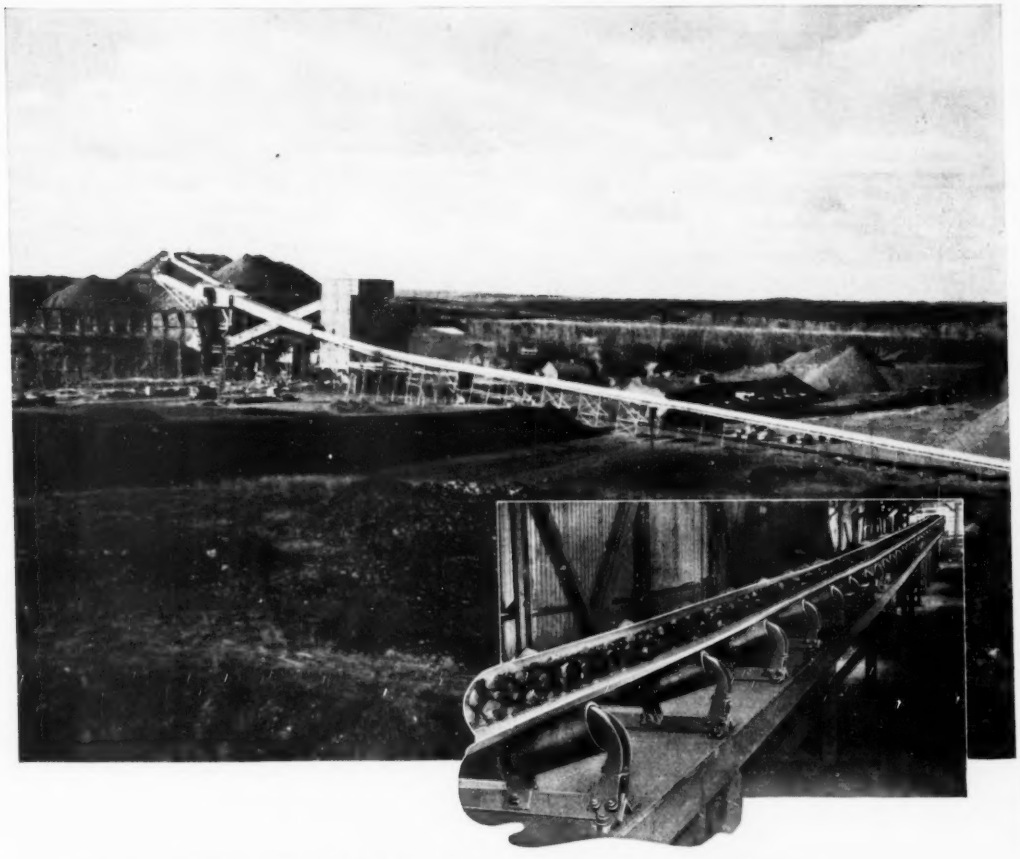
NEWFOUNDLAND—A $2 million development program has been started by the *Buchans Mining Company*, following the discovery of a new orebody which is said to have extended the life of the zinc-lead-copper mine by eight to 10 years. The company is owned jointly by the *Anglo-Newfoundland Development Company* and the *American Smelting & Refining Company*. The discovery was made one mile from the company's Lucky Strike shaft.

YUKON—*United Keno Hill Mines, Ltd.*, operating in the Mayo district, reports that ore and concentrate shipments this year will be increased to 10,000 tons, containing 2,500,000 oz. silver and 7,000,000 pounds lead. During 1950, after the Elsa mill capacity reaches 225 tons daily, production will be further increased to 3,000,000 oz. silver and 11,000,000 pounds lead. Indicating a long life for the mines are present plans to construct a million dollar hydro-electric power plant in the district which will require two years for completion. Operations so far this year have resulted in a 30,000-ton ore reserve increase.

QUEBEC — At Noranda, *Elder Mines, Ltd.* expects to increase its shipments to Noranda Mines to 12,000 tons monthly by midsummer. According to mine manager A. H. Honsberger, the new block of levels drilled down to the 1,000′ slope horizon last year gives promise of increased tonnage. The Nos. 1, 3 and 5 veins have an indicated combined length of 1,793′ between the 800′ and 1,000′ levels over an average width of 7.5′ of mine grade.

SASKATCHEWAN — Financing has been arranged by *Studer Gold Mines, Ltd.*, for the development of its property on Sulphide Lake, 30 miles north of the village of Lac La Ronge. The group consists of 45 claims, through which a wide shear in greenstone has been traced the length of the property, and an adjoining group of 35 claims, also under Studer ownership. An ore lense has been exposed for 950′ within the shear, and about 80 trenches also have been excavated, exposing a vein from seven to 30′ in width and averaging, so far as tested, $7.35 a ton.

ONTARIO—An underground program, which will cost an estimated $400 thousand, is now being carried



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out by *Chesterville Mines, Ltd.* at its gold property near Kearns. At present, preparations are being made for the installation of a crusher at the 20th level and the sinking of another shaft below this level. The new crusher will be placed in operation early next year while actual sinking will begin in 1951. It is anticipated that savings resulting from operation of the crusher alone will equal total costs of the two installations. As regards ore reserves, it is said that at least 50 percent, or 750,000 tons, is between the 17th and 20th levels.

BRITISH COLUMBIA—Under an agreement with the *Consolidated Mining and Smelting Company of Canada, Ltd., Hedley Mascot Gold Mines, Ltd.* is reopening the *Sunloch* gold mine on Vancouver Island. A stipulated amount of $25 thousand will be spent by Hedley in exploration this year, $50 thousand next year, and if results are favorable, a 300-ton mill will be erected to bring the property into production by November, 1951. Eighty percent of the Sunloch is owned by Cominco.

MEXICO—For the announced purpose of stimulating mining by affording greater facilities for prospecting and exploitation, particularly by gambusinos, the Ministry of National Economy will establish nineteen mining agencies in the States of Guerrero, Hidalgo, Chihuahua, Durango, Guanajuato, Zacatecas, and Coahuila. The ministry is encouraging gambusinos in those states by reduced taxes and may even, according to reports, grubstake productive prospectors.

OREGON — Ray R. Stevenson recently returned to Durkee, where he has been engaged during the past year in preparing 10 miles of the Burnt River placer ground for dredging operations. An electric power line that runs the entire length of the property has been installed, and a good country road provides access to the property. Stevenson estimates that he has more than 10,000,000 cu. yds. of 25′ dredging ground.

MEXICO—Mining in a wide section of Guerrero will benefit from the newly completed 100-ton capacity mill of the *Cia. Concepcion Carmen y Anexas, S. A.* at Mexcala, Guerro. Besides serving Guerrero, one of Mexico's greatest gold and silver mining regions, the new plant is also expected to benefit mining activities in the adjoining State of Morelos.

BRITISH COLUMBIA — *Hedley Mascot Gold Mines, Ltd.*, which has paid $1.3 million in dividends from its operations in the Similkameen, is now planning installation of a 500-ton mill at its *Sunloch* copper-gold mine, 31 miles from Victoria. Meanwhile, Manager V. J. Creeden reports that a diamond drilling program is under way at the Sunloch and adjacent *Gabbre* property.

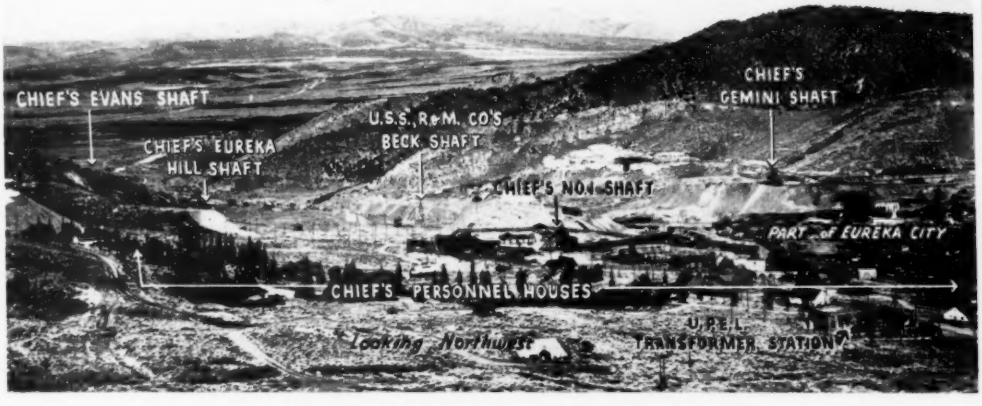
ALASKA—Ralph Browne of the Alaskan Development Board recently completed a six weeks trip from Point Barrow to Unalakleet on the Seward Peninsula and reports the presence of high grade pitchblende ore in that area.

QUEBEC — I. J. Chuchem, president of *Chuco Gold Mines, Ltd.*, has announced that funds have been acquired to carry out development at the company's uranium prospects near St. Michel des Saints in Maisonneuve township.

ONTARIO—Testing operations of the *Kingdon Mining Company*, 42 miles west of Ottawa, are being concentrated on the east and west extensions of the main vein from which previous operators drew 905,000 tons of lead ore. This main zone was developed and mined to a depth of 1,400′ along a horizontal length of 2,000′ during production operations between 1915 and 1931.

BRITISH COLUMBIA — *Sheep Creek Gold Mines, Ltd.* is building a 50-ton mill at its *Paradise* lead-zinc mine which it acquired in 1942 on Toby Creek, 18 miles west of Invermere. According to President A. E. Jukes, the mill is expected to be in operation by July 1.

QUEBEC — At the *New Calumet*



NEW DEVELOPMENT TO START IN UTAH'S TINTIC MINING DISTRICT

Cecil Fitch, Jr., general manager of the Chief Consolidated Mining Company of Eureka, Utah, reports that the Consolidated Goldfields of South Africa and E. J. Longyear Company of Minneapolis, Minnesota, are joining in a project to drive a 1,900′ drift on the 1,800′ level of the Chief Consolidated property in the Tintic mining district. The object of the drift will be to connect the Chief Consolidated with an area explored last fall by churn and diamond drills north of the Leadville fault. The company, which had a net profit of $188,353 in 1948, accomplished 16,984′ of development and 7,354′ of diamond drilling during the year.

Mines, Ltd. operation on Calumet Island in the Ottawa River. Managing Director J. M. Cunningham-Dunlop reports an excellent grade of ore being developed as drifting progresses on the 1,200' level. Current production is averaging more than $300 thousand monthly, with values in lead-zinc-gold-silver.

MEXICO—Mining companies in Durango and Chihuahua, dependent on La Boquilla Electric Company of Chihuahua for electric power, were spared crippling of work when a strike threatened against the power company was warded off. The labor ministry obtained a settlement with a 25 percent pay hike.

BRITISH COLUMBIA — *Bralorne Mines, Ltd.*, operating in the Bridge River district west of Lillooet, produced at the annual rate of $3 million plus for the first time since 1942, during the first three months of the year, according to recent reports. The mill operating at capacity produced 22,211 oz. gold from 46,816 dry tons. Maintenance of this rate depends on the manpower supply which continues to show seasonal fluctuations.

MONTANA—The *Anaconda Copper Mining Company* will expand its Great Falls Reduction Works at Great Falls, with the construction of $1.8 million in additional facilities, according to R. B. Caples, manager. To be completed by July, 1950, the project includes installation of a plant to cast copper billets and an additional unit to the zinc processing department. The zinc plant now has eight units and is the largest single operation of its kind in the world, handling concentrates from a number of western states.

ARIZONA — The Ajo Smelter of the *Phelps Dodge Corporation* should be completed and in operation before the end of 1950, according to a recent statement by Robert G. Page, corporation president. He said that work on the $11 million project is being pushed as rapidly as possible and that site preparation and other preparatory work have been completed. The extension to the power plant at Ajo is expected to be completed in mid-1949.

ALASKA—C. H. Kramer is operating a hydraulic outfit on Chititu Creek in the Copper River drainage again this season with a crew of 13.

BRITISH COLUMBIA—Glenville H. Collins, president of *North American Goldfields, Ltd.*, Vancouver, announced recently that his company has interested the *Yuba Construction Company* of San Francisco in testing the North American placer leases at French Flats on the Quesnel River. If test results are satisfactory, Yuba contemplates installation of a 10,000 cu. yd. dredge.

NEVADA — A diamond drilling program to probe new depths is scheduled by the *Nevada Equity Mining Company* at its *Lander Hill* silver properties near Austin. The group comprises most of the mines worked on a major scale in the 1870's when the Austin district was Nevada's second largest silver producer, ranking next to the Comstock Lode. At that time, orebodies were worked to an approximate depth of 2,500'.

BRITISH COLUMBIA — According to a recent announcement, *The Consolidated Mining and Smelting Company of Canada, Ltd.* will spend $12 million on the modernization of its lead smelter at Tadanac, a suburb of Trail. Of interest besides the Sullivan mine and Trail smelter is the company's *Con* mine at Yellowknife where the Campbell shear zone was reached in 1948 and indications of possible new orebodies were obtained. The long term future of this operation is promising provided that there is some improvement in the economic conditions handicapping all Canadian gold mines at the present time.

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BRITISH COLUMBIA—A mining plant and necessary equipment has been received by *Gwillim Lake Gold Mines, Ltd.*, which is preparing for production its silver-lead-zinc properties in the Columbia River area near Invermere. Initial shipments will be made from partially developed exposures that were formerly sources of production.

BRAZIL—A huge project, involving construction of new iron plants, electrical railroads and piers in Espirito Santo and Rio, is to be undertaken in order to increase production and subsequent exportation of manganese. Although no official statements have been made, it is understood that the plan includes the *Central do Brasil Railroad, Rio Doce Valley Company* and the *Siderurgical Company of Volta Redonda.* Most of the additional manganese made available by this expansion program will be exported to the United States, according to the recent agreements of the Abbink Mission.

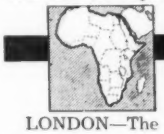
BRITISH GUIANA—A new Anglo-Canadian company, *Plantation Bauxite Company, Ltd.*, was formed recently in Georgetown to develop extensive bauxite deposits on the west bank of the Demerara River. Owned jointly by the *Demerara Bauxite Company, Ltd.*, a subsidiary of the Aluminum Company of Canada, and the *British and Colonial Bauxite Company, Ltd.*, the new firm plans construction of several miles of railroad and mine track.

PERU—The *American Smelting & Refining Company* has acquired two new copper properties, the *Toquepala* and the *Quellaveco*, 20 miles apart, in the Andes Mountains of Southern Peru. It is estimated that about two years will be required to evaluate the properties as to commercial orebodies, necessary before heavy investments are made to place them in production.

ARGENTINA—According to reports from Buenos Aires, an important deposit of uranium has been discovered in Serra Ambato in the province of Catamarca. Analysis of the deposit is said to have revealed a good percentage of radioactive ore.

BRAZIL—The National Department of Mineral Production recently completed exploration of a new zirconium deposit at Minas Gerais and reports a total of 3,000 tons of good quality ore available. The deposits, which are six miles from Andrada and 20 miles from Pinhal, are said to be available to those interested in exploiting them.

CHILE—According to a Reuter dispatch, Chile's domestic production of iron and steel this year will not only be adequate to cover all domestic requirements but will also permit limited exports. *Cia. Siderurgica de Valdiva* has scheduled for production 18,000 tons of iron and steel, of which 6,000 tons will be available for export.



LONDON—The continued decline in American base metal prices and the rigid Government-fixed British prices are causing considerable anxiety to merchants. Zinc is £101 per ton compared with the American price of £72; copper is £119 per ton compared with the British price of £140. With the slide looking set to go on in America, British traders are vehemently demanding the reopening of the Metal Exchange to enable them to cover losses such as they are now sustaining.

SOUTH AFRICA—Results of the 1948 operations of the *Union Corpo-*

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ration have just been published and show a considerable improvement over the figures for the strike-ridden year of 1947. Four of the corporation's mines showed increased profits, and all record a slight decline in working costs. The *Grootvlei* mine reported a record of 1,960,000 tons milled, with payability improved at 57 percent, although values were down to 290 in. dwt. against 319 in. dwt. in the previous year. Ore reserves expanded by 500,000 tons to 11,300,000 tons value 5.2 dwt., sufficient to keep the mill operating for six years at the current rate of production. Mines held by the corporation include: the *Grootvlei*, *Geduld*, *East Geduld*, *Marievale*, *Van Dyk*, and *St. Helena*.

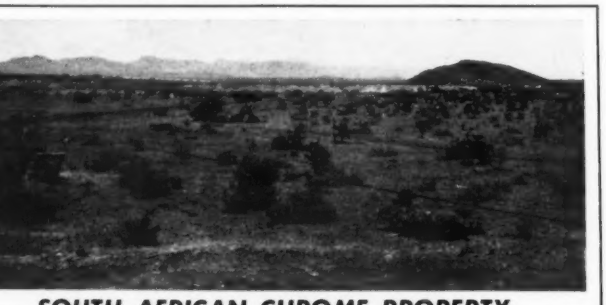
NORTHERN RHODESIA—Coal shortage is again holding up copper production in the Northern Rhodesian field. Limited rail transport is the prime cause, aggravated just lately by Southern Rhodesia's action in retaining for her own industries the coal she has been sending to the North. Creech Jones, the British Colonial Secretary, now in Rhodesia, is, no doubt, being pressed to expedite the answer to one of Rhodesia's chief worries—rolling stock for the poorly equipped railways.

GOLD COAST—West African gold coast shares, for a long time a derelict market, are attracting some interest on the London market following strong political representation concerning their condition in the British House of Commons. A subsidy or an increased gold price would bring back to a profit-earning basis many mines whose activities have had to be curtailed or suspended. Meanwhile, the foreshadowed suspension of work took place at *Central Wassau* mine which has now been placed on a maintenance basis.

ORANGE FREE STATE—At the *Union Corporation's St. Helena* mine, the first of the new Orange Free State field to get into production, the development figure for the first quarter of 1949 was not up to the more exuberant market hopes, but 402 in. dwt. was considered fair as a beginning on the underground work. Supplying details of development so far achieved, consulting engineer S. R. Brown reports the first of the property's shafts, a 30-degree incline, has reached its final depth of 2,928'. More rapid progress than had been expected was made as a result of a large section of ground which did not require concrete lining. The second shaft, a vertical, reached a depth of 1,342' by the end of December, but was only halfway to its final depth, progress being hampered by numerous stoppages for cementation of water influxes. Development from the No. 2 and No. 4 level stations in the inclined shaft began last September and, by the year's end, 3,026', mainly crosscutting to reef, had been accomplished. Of this, 130' was on Leader Reef and 254' on Basal Reef, but as has been expected from borehole results, no payable values were found. The shaft was sited at that point because of moderate reef depths and not because of prospects of payable reef in the immediate vicinity. Later, however, it was reported that of one section of 140' of Basal Reef sampled, 90' proved payable at 47.4 dwt. a ton over 10", a most heartening result in view of the above-mentioned considerations.

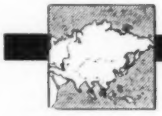
NIGERIA—The Chairman of *Bisichi Tin* reports that 1948 production rose to 500 tons of tin concentrates and 122 tons of columbite, as compared with 472 and 108 tons, respectively, in 1947. It is also reported that costs have been reduced.

TRANSVAAL—Encouraging development results have been reported by J. A. D. Gillespie, a director of *Eastern Transvaal Consolidated Mines, Ltd.*, operating the *New Consort*, *Sheba*, and *Mamre* mines in the Barberton district of the Eastern Transvaal. At the New Consort, 13,386' of reef development was completed, 11,771' being sampled of which 19.5 percent was payable and averaged 26.4 dwt. over 49.5". The latest ore reserve estimate of this mine is 135,000 tons at 8.93 dwt. per ton over 81". At the Sheba, 27.9 percent of the 14,794' of reef developed and sampled was payable and averaged 25.8 dwt. per ton over 39". Ore reserves are estimated at 126,000 tons at 6.84 dwt. per ton over 51.6". At the Mamre, results were comparatively unfavorable, as none of the 118' of reef developed was found to be payable; however, the estimated ore reserves show an increase of 13,480 tons to 18,800 tons, this increase being due to the inclusion of safety pillars, permission for the mining of which was recently obtained from the Department of Mines.



SOUTH AFRICAN CHROME PROPERTY

Above is a panorama of the Zwartkops property of the recently formed Chrome Mines of South Africa, Ltd., an amalgamation of the interests of the Union Corporation, Ltd., and the African Mining and Trust Company Pty., Ltd. The property is in the northern Transvaal on the famous Bushveld igneous complex, rimmed by mountains that contain South Africa's main iron ore deposits.



CEYLON—A new £1,800,000 firm, to be known as the *Bogala Graphite Corporation (Ceylon), Ltd.*, is being formed with a view toward revolutionizing graphite mining in Ceylon and establishing secondary industries of world-wide import. First of the new corporation's steps has been to purchase the Bogala mines at a reported price of £1,700,000. Fifty percent of the shares will be held by the present proprietors of the Bogala mines, while the remaining 50 percent will be owned by the Pilot Industrial Trust in London. Directors of the Trust include: Lord Barbazon of Tara; Lord Semphill, and John J. Denny, chairman. Technicians are reported to have arrived in Ceylon to advise on starting secondary industries and to modernize the mines so that production can be expanded from 500 to 2,000 tons monthly.

BURMA—One of the favorite gambling shares on the London market for Americans are the nine rupee shares of the *Burma Corporation*. These shares took a slump recently when the corporation's London office announced that the railway has been closed by terrorists since January 23, necessitating the postponement of the rehabilitation program. Workmen have been discharged, and the mine has been returned to a maintenance basis. Meanwhile, the shares which were up to 12 shillings and 9 pence last year are now down to 4 9.

MALAYA—A £5,000,000 grant is to be made by the United Kingdom to the tin producing Federation of Malaya to help cover internal expenditure, while an added £1,000,000

will also be provided for the extra expenditure likely to be incurred on the Imperial Forces in Malaya during the year. The bill to authorize a loan of 100 million Straits dollars, part of which would be raised in London, was before the legislative council of the Malayan Federation at latest reports.

INDIA—According to late reports, the Provincial Government has been considering whether the aluminum project for the Central Provinces and Berar should be run exclusively as a State-owned concern. Of the authorized capital of Rs. 5 crore (50,000,000 rupees), the Central Provinces and Berar government had originally wanted to subscribe Rs. 1.5 crore, leaving the balance to be paid by the public. The Government of India has not taken any shares. The original scheme called for a plant with a production capacity of 5,000 tons per year and a capitalization of Rs. 3.75 crore, increasing capacity to 50,000 tons within 15 years.

TURKEY—A program to increase the output of chromite from the Government's *Guleman* mines by 66,000 tons in the current year has reportedly been presented to the E.C.A. Mission in Ankara. A Hungarian delegate, meanwhile, arrived in Ankara to negotiate the purchase of 50 percent of Turkey's 1949 output.

CHINA—General Chiang Chi-Chung, Chinese Inner Cabinet member in charge of current negotiations for the granting of mineral rights to the Soviet Union in Sinkiang, said recently that the Russians would not obtain a monopoly in the province if an agreement were signed. Such an agreement would, if concluded, remain secret. The negotiations, reported by Reuter, are believed to include rights for uranium and wolfram.

TURKEY—Under a recent trade agreement, Turkey will provide Austria with an annual minimum of 40,000 tons of chromite.

INDIA—*Central Provinces Manganese Ore Company*, large Indian producer, reported recently that the transport situation during the past year had been unsatisfactory although recent months have witnessed considerable improvement.

OCEANIA

WESTERN AUSTRALIA—A. Norwood, *Spring Valley Tin's* consulting engineer, reports that the company's alluvial ground is wider than originally thought, and bucket dredging is being considered as a later possibility for the low-grade marginal ground. The sluicing plant will be placed on a pontoon, all pumps will be electrically driven, and power will be generated by a Diesel alternator.

NEW ZEALAND—It is reported that the possibility of extracting substantial quantities of titanium from Taranaki iron sands by electric smelting methods is being explored near Nelson.

QUEENSLAND—*Mineral Deposits Syndicate* will extend its operations in beach sands to the most northerly part of Fraser Island. The necessary authority to prospect has been granted to A. G. Darling, a member of the syndicate.

NORTHERN TERRITORY—The 1,000′ shear zone discovered on the *Lady Claire* properties will be found even more extensive following exploration, M. McKeown, consulting engineer, has opined. Values up to four ozs. per ton have already been proved to a depth of 58′. The workings were partially inundated recently when six in. of rain fell in an hour.

NEW SOUTH WALES—According to H. G. Darling, chairman of *Australian Iron and Steel, Ltd.*, extensions now being made to the Port Kembla steel plant will raise the capacity by 780,000 tons annually. At present, the program is being delayed by continuous shortages of coal, labor and materiel. The company's No. 1 blast furnace has been idle since July 22, 1946.

WESTERN AUSTRALIA—The Commonwealth Government is taking legal steps to recover £219,021 advanced to *Blue Spec Gold Mines*, N. L., which has estimated ore reserves above the No. 3 level at 27,000

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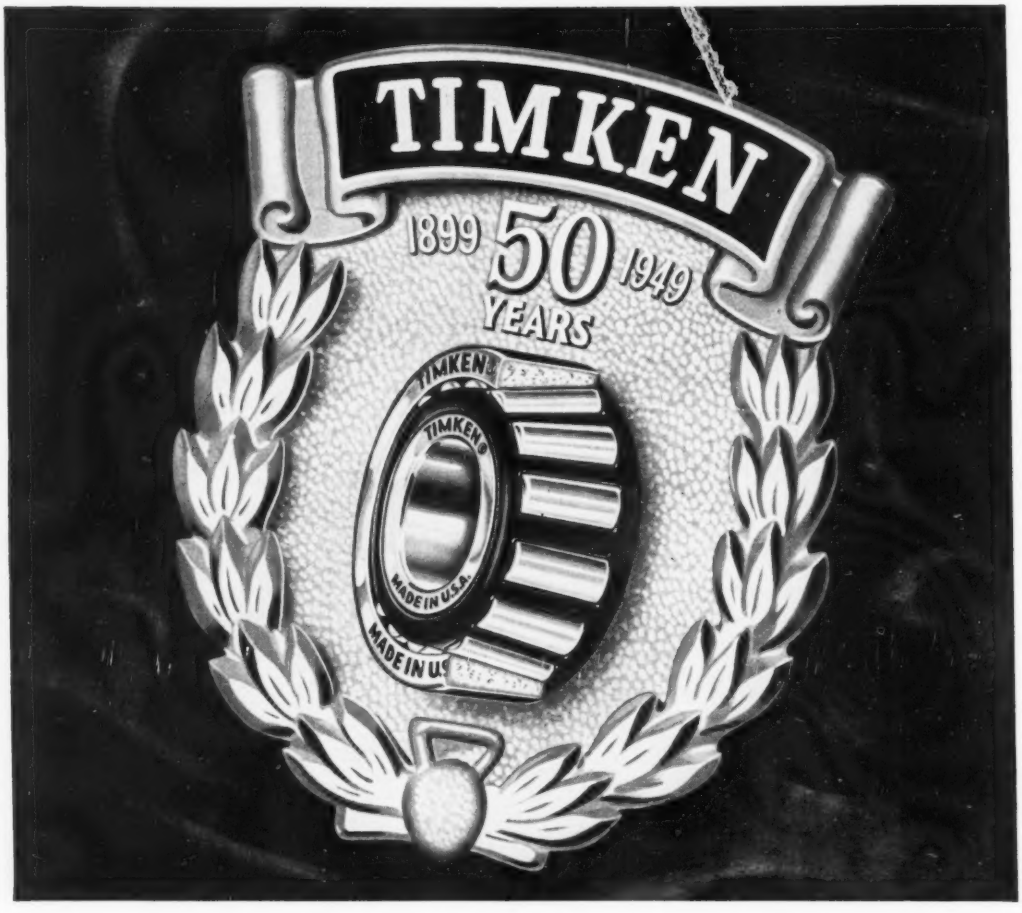

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short tons averaging 16 dwt. gold and 2.6 percent antimony. Losses last year approached £40,000—about £10,000 on operations and £27,000 interest on advances. The mill operated for only five months of the year.

QUEENSLAND—*Alluvial Prospectors* has been granted an extension of time to continue prospecting its Mount Garnet tin area. Delay in securing the plant has held up the drilling schedule.

NORTHERN TERRITORY—The chairman of directors of *Mount Todd Gold Mine N. L.* recently gave a summation of the rapid rise in mining costs: Messing costs alone had risen by more than £3,000, and the 40-hour week, higher costs for materials, wages and freights also contributed. The labor shortage made it possible for men, brought in from southern states at considerable expense, to leave after a few weeks of service. In preparation for production, large tonnages of payable ore have been proved by systematic sampling, and the shafting, ball mill, agitators and stamp battery tested. A small parcel of ore is to be crushed for bedding thickener.

NEW SOUTH WALES—At *New Butler's Tin Mines, Ltd.*, Torington, the B winze below the No. 2 level is now down to 91' in reef five ft. wide, carrying 0.5 percent tin values. Manager Dawson believes the mine can maintain production at about four tons of tin oxide monthly.

WESTERN AUSTRALIA—L. Ives, managing director of *New Fairplay Gold Mine N. L.*, reports that lack of water has forced the company to dismiss excess labor. Anticipating sufficient water for the operation of five mills, an adequate number of men were engaged accordingly; however, it has been found possible to operate only three mills, at least for the time being.

QUEENSLAND—*Sugarloaf Tin N. L.* has transferred operations to Kyoomba, where it is estimated there are 45,000 yds. of 1.5 lb. tin.

NORTHERN TERRITORY—The center of gold mining interest still continues to be the Tennant Creek operations. The *Noble's Nob* mine gives an average value of 40 dwt. gold per ton from 20' to 113' on the main crosscut at the 135' level. Several companies are being formed to operate on the main orebody which is now being opened.

WESTERN AUSTRALIA—Beach sands at Doubtful Bay are now being prospected by F. A. Pinchin, one of the founders of *Rare Metals, Ltd.* Pinchin claims Western Australian beach sands are superior to similar deposits in the eastern states, as they are freer of chromium.

QUEENSLAND—*Tableland Tin Dredging Company N. L.*, Mount Garnet, treated 363,000 yds. for 68½ tons of tin concentrates during four weeks ending April 5.

VICTORIA—After pyrites shifted in the vessel Kowhai, en route from Tasmania to Melbourne, the Seaman's Union alleged that cargoes of this type have proved dangerous. A few weeks earlier the cargo of the Enfield had experienced a similar shift. The ship's agents (Union S.S.) offered a £30 a man compensation, but this was refused. After some weeks of idleness, the ban was lifted on the Enfield and Eugowra, but the Kowhai, at the last report, was still tied up pending the settlement of a danger money claim now being heard by conciliation commissioner H. Knight in Sydney.

SOUTH AUSTRALIA—The "walk-the-hill" dispute at *Broken Hill Proprietaries' Iron Monarch* property has developed into a strike, causing the shutdown of the Whyalla blast furnace. Freighters arriving at Whyalla for iron ore have returned empty to Newcastle. According to A. J. Gibb, president of S. A. Metal Industries, closing of the Newcastle and Port Kembla steels works will be inevitable if the strike is prolonged.

PHILIPPINES—The *Balatoc Mining Company*, a subsidiary of the *Benguet Consolidated Mining Company*, has been awarded $4.5 million by the War Damage Commission for wartime property destruction and a down payment of $1.5 million made. The down payment was used to end Balatoc's indebtedness to Benguet which, in turn, has discharged its indebtedness to a bank and to the four Haussermann family trusts. Both Benguet and its subsidiary are now free of debt, according to Judge John W. Haussermann, New Richmond, Ohio, president and general manager of Benguet.

WESTERN AUSTRALIA—At Kalgoorlie, an empty skip recently dropped 3,200' to the bottom of the Edwards shaft, the steel winding rope piling up in a tangled mass above it. After surveying the damage, Manager J. Hylton announced that instead of shipping the rope to Castlemaine, Victoria, repairs would be effected locally. Provided steel is available for the repairs, the shaft will be working again within three months. In the meantime, all ore will be hauled through the Hamilton shaft and throughout maintained at 20,000 tons a month.

EUROPE

SPAIN—Although Spain has had abundant reserves of tin in its factories and warehouses during the past few years, she is now faced with a critical shortage. Recently, one tin plate factory suspended operation of four tinning machines for lack of the metal. For this reason, she is said to be contemplating imports although it means using her limited foreign exchange.

ENGLAND — At the Camborne School of Mines, the largest mining

PHILIPPINE'S TOP GOLD PRODUCER

The first Philippine gold mine to resume operations after the Japanese occupation of the Islands was that of the Benguet-Balatoc Consolidated Mining Company. Badly wrecked during the occupation, the company's mill was rebuilt, representing an outstanding engineering achievement accomplished under great difficulties. The Dorr Company furnished a large quantity of repair parts to replace those damaged and destroyed, plus considerable new equipment. Included in this equipment was a Dorr bowl classifier and Dorr tray thickeners, agitators and pumps for the grinding and cyaniding circuits. Before the war, Benguet-Balatoc was the second largest gold producer under the American flag. Resuming operations in 1948, tonnage was quickly built up to 1,450 daily, while its current goal is 4,000 tons.

college in the country, a maximum number of students are engaged in industrial research, chiefly on the concentration of pyritic alluvials from Malaya. A Humphrey Spiral and a Denver Buckman concentrator are being installed in the mineral dressing laboratories, part of which is being remodelled.

FRANCE—The E.C.A. Mission to France has announced that the French aluminum industry will receive $2.4 million of American aid to buy equipment for the production of aluminum foil. The expanded program is expected to increase the output of two French producers, *Establissments Charles Coquillard* at Froges and *Soc. des Trefileries et Laminoirs du Havre* at Le Havre, to 4,000 tons, against the current domestic demand of 3,000 tons.

NORWAY — Described as Norway's largest industrial undertaking, the new iron and steel plant at Mo-in-Rana will be powered by a new station at Rosaga, to be constructed beneath a mountain. Some 70,000 cu. yds. will be excavated for the initial installation of three generators, aggregating 115,000 kws.

PORTUGAL—It is reported that the Portuguese Government is planning to develop hematite deposits occurring in the upper reaches of the Douro River. Under this plan, it is hoped that ore will be available for export as well as for production of steel for domestic consumption.

GERMANY—According to reports from Frankfurt, production of primary unalloyed aluminum in the Anglo-U. S. zones of Germany rose sharply to 792 tons in February, compared with 238 tons in December and 277 tons in January. Of the February total, 602 tons came from the *Lippe Works* at Lunen while 190 tons were produced at the *Toeging* plant in Bavaria. A further expansion is expected.

AUSTRIA—Experiments are now being made on quantities of domestic antimony ores in an attempt to work out a satisfactory process thereby enabling the export of considerable amounts of the metal.

ENGLAND—At the *South Crofty* mine near Camborne, Cornwall, development on the No. 3 lode in Robinson's section is reported to be proceeding satisfactorily. As part of the underground mechanization program, two more Eimco-Finlay loaders were recently delivered.

YUGOSLAVIA—The kaolin mine of Wrbitza, said to contain a refractory grade white kaolin of pure and good quality, is being reopened to supply Yugoslavia's ceramic industry. A 40 h.p. winder equipped with 70" diameter drum is now under construction, and sinking of a 450' shaft is being carried out.

GERMANY—In the Soviet zone, uranium mining is reportedly being stepped up, with 31 new pits being opened up in the Johann-Georgenstadt area on the Czechoslovak frontier, south of Aue.

GERMANY—The newly opened lead-zinc mine at Maubach, operated by the *Stolberger Zinc Ag*, is expected to produce about 900 tons of recoverable lead and zinc each during 1949. By 1953, production is to be increased to approximately 10,000 tons lead and 8,000 tons zinc concentrates.

AUSTRIA—Production of graphite, an important export item to countries with hard currency, is being stepped up, and this year's output is expected to approach the pre-war output of approximately 18,000 tons. Principal properties figuring in this increased production are the *Muehldorf* and *Persenberg* mines in Lower Austria, Soviet Zone.

POLAND — The necessary funds for the purchase of metals in 1948 were taken from Poland's production of 70 million tons of hard coal. Although Poland has zinc and lead resources adequate to supply domestic needs, the majority of minerals do not occur in Polish territory. Consequently, coal exports to Russia and Sweden in return for dollars enables Poland to purchase metals on the world markets.

ENGLAND—At the *Great Rock* micaceous hematite mine, Hennock near Newton Abbot, development results are reported to have improved recently, and production is being maintained at a good level. Another firm is also prospecting for micaeous iron ore in this part of Devonshire and are treating old dumps as well.

GERMANY—A new shaft is to be sunk at the lead mine operated by *Mechernicher Werke, Mechernich*, in the western part of its concession. At present, about 2,000 tons of low-grade crude ore is bein mined daily, from which concentrates of a very high purity are produced.

AUSTRIA — Importing of about 350,000 tons of iron ore during the remainder of 1949 is planned by the Government, as the domestic production of 1.5 million tons is not adequate for the country's needs. Also scheduled for import is 25,000 tons of manganese, mostly from Hungarian mines.

ENGLAND—At the *New Consols* mine on the border of Devon and Cornwall, some 150 men are now employed, and good progress in development is reported. Construction of the concentrating plant is also well under way, with power for this and other equipment being supplied by two turbines and electricity brought in from the mains. Last worked in 1877 for its copper values, as well as some arsenic, gold and silver, the mine is now being developed for tin.

YUGOSLAVIA—As the absence of qualified mining engineers has been the main obstacle in effecting the rehabilitation of the Yugoslav mining industry, the several well-known German experts are now being employed to assist in the large-scale development plans of the Government. This action has followed the withdrawal of Russian technical advisers last year.

GERMANY—The newly developed *Christian Levin* mine is now producing about 4,000 tons of crude ore monthly, containing approximately nine percent lead and some zinc. So far, the ore has been treated by the concentrating plant of Gewerkschaft Stein V, but the erection of a flotation mill at the mine is being contemplated.

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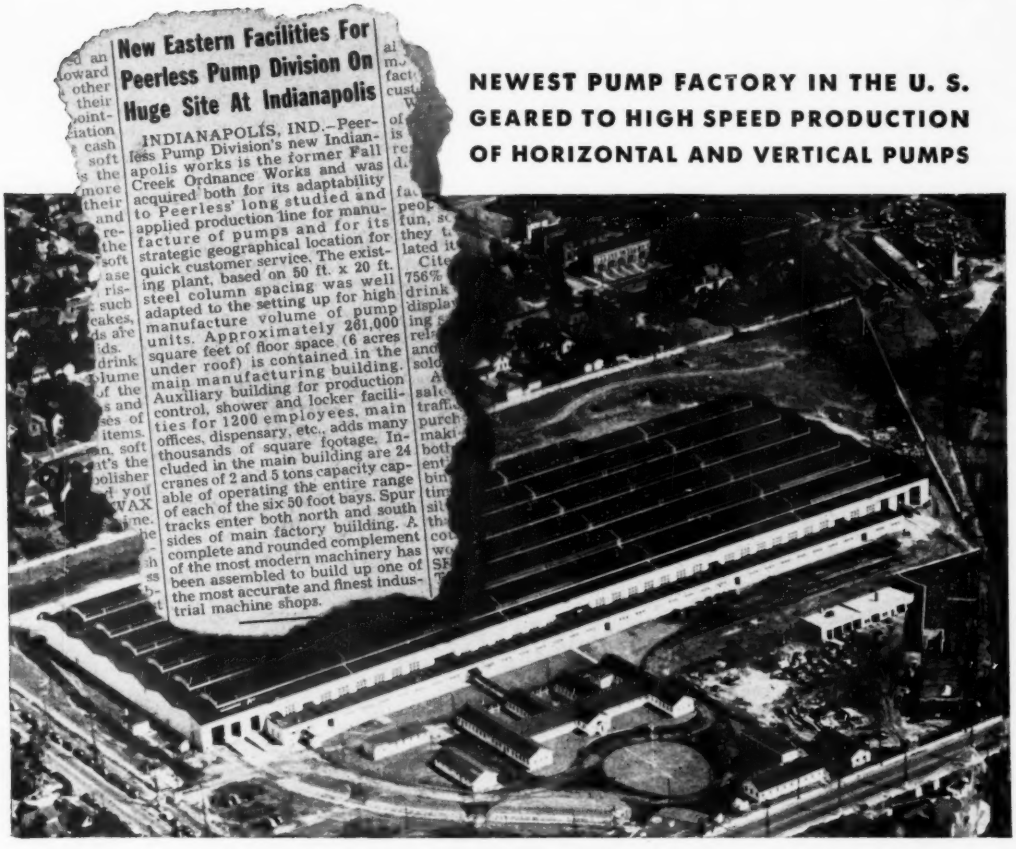
New Eastern Facilities For Peerless Pump Division On Huge Site At Indianapolis
INDIANAPOLIS, IND.—Peerless Pump Division's new Indianapolis works is the former Fall Creek Ordnance Works and was acquired both for its adaptability to Peerless' long studied and applied production line for manufacture of pumps and for its strategic geographical location for quick customer service. The existing plant, based on 50 ft. x 20 ft. steel column spacing was well adapted to the setting up for high manufacture volume of pump units. Approximately 261,000 square feet of floor space (6 acres under roof) is contained in the main manufacturing building. Auxiliary building for production control, shower and locker facilities for 1200 employees, main offices, dispensary, etc., adds many thousands of square footage. Included in the main building are 24 cranes of 2 and 5 tons capacity capable of operating the entire range of each of the six 50 foot bays. Spur tracks enter both north and south sides of main factory building. A complete and rounded complement of the most modern machinery has been assembled to build up one of the most accurate and finest industrial machine shops.

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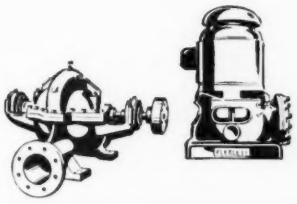
Here is one of America's most modern pump factories. Peerless Pump's new plant at Indianapolis is devoted entirely to making pumps and handling pump service. All types of pumps in the Peerless line, horizontal centrifugal, deep well and close-coupled turbines, Underwriters' approved fire pumps and domestic water systems are made and serviced in this plant. No expense has been spared in tooling Peerless-Indianapolis to insure accurate pump production; testing facilities at Indianapolis are being incorporated into one of the largest pump laboratories in the country. Add these factors to sound basic Peerless pump designs, to the high caliber of Peerless personnel and to Peerless extensive manufacturing facilities at Los Angeles, California, and they combine to make available as comprehensive pump service as is offered to pump owners and buyers anywhere. Peerless-Indianapolis is open for your inspection. You are cordially invited to see for yourself how Peerless-Indianapolis will exactly fit your needs for pumps and pump service. Plan with Peerless; there are horizontal and vertical types for most services, in all industries. Descriptive Bulletins are available on all types upon request.



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NEW METHODS — NEW EQUIPMENT

FREE MANUFACTURERS' LITERATURE

ALLIS-CHALMERS MFG. Company's new bulletin, "Allis-Chalmers Fine Reduction Crushers," Bulletin 07B6425A, tells how it is possible to get a small finished product from a large sized feed in one operation.

NORDBERG MFG. CO. announces new Bulletin 165 on a Nordberg Type 4FS-1 four-cycle, one-cylinder, 4½ x 5¼" Diesel engine. It was developed to meet the need for a simple, compact, dependable engine capable of continuous heavy duty service.

CATERPILLAR TRACTOR CO. has a new eight-page booket, "Caterpillar Diesel DW10 in Action," describing many applications of the high-speed unit.

ALLIS-CHALMERS MFG. Company's 12-page bulletin, describing Vari-Pitch speed changers for increased production and greater machine versatility, is now available.

AMERICAN BRAKE SHOE COMPANY'S bulletin, "How to Solve Corrosion Problems," is now available.

HARDINGE COMPANY'S bulletin, covering conical mills (with operating data and flow sheets), convex-head cylindrical mills, rod mills, and related equipment. Bulletin number AH-389. They have also recently published a treatise on dry grinding—Bulletin number 17-B.

ALLIS-CHALMERS' modern, metal-enclosed low voltage switchgear and drawout air circuit breakers are described in a new 8-page bulletin released by the company. Bulletin number 18B6376A. Also, a new service manual, covering the operation, maintenance, and major repair of the AD-s and AD-4 Motor Graders, has just been released. This new service manual can be purchased at the list price of $4.00 per copy.

MACK TRUCK'S liberally illustrated catalog, featuring a newly designed 4-cycle, 6-cylinder, 150 h.p. Diesel engine, is just off the press. Ask for END 672. A companion piece to the above catalog is a booklet entitled "Understanding the Automotive Diesel."

HARNISCHFEGER CORP. announces availability of a new Diesel electric shovel which provides electric shovel efficiency independent of power line service. This new shovel is described in Bulletin X83-DE.

ALLIS-CHALMERS MFG. recently released a new bulletin describing construction features of the Allis-Chalmers Balke jaw crusher which is built in five sizes with receiving openings from 10 by 7 to 30 by 18 inches. Bulletin 07B7090.

Copies of all bulletins may be obtained by writing MINING WORLD, *121 Second St., San Francisco 5, Calif. Please refer to bulletin number when mentioned.*

3146 ft. Sullivan Class WN4, 500 HP. 3 P., 60 C 2300 Volt. Direct Connected 125 lb. Pres. Air Compressor
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70 in. x 35 ft. Ruggles Coles XB Indirect Dryer.
8 ft. and 10 ft. Grayco Air Separators.
1—36" x 42" and 40" x 48" Buchanan Blake Type Panel Sections Jaw Crushers.
2—74,000 Bbl. Cap. 114' x 40' Steel Storage Tanks.
30 x 13 Farrel B Jaw Crusher.
2' 4" Traylor Ty Fine Gyratory.
30 in. Superior Gyratory A.C. Crusher.

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WEMCO Announces New Drum Separator

Western Machinery Company, San Francisco manufacturer of mining and milling equipment, recently announced the addition of a Drum Separator to their well known line of equipment for Heavy Media Separation. The Wemco Drum Separator, now in production, incorporates a number of exclusive design features of the Wemco organization in mineral dressing.

The new unit has been specifically developed to meet increasing demand for an HMS separatory vessel that will treat coarse material. The Drum Separator will treat particle sizes ranging up to 8", in capacities up to 420 TPH, depending on size units used.

According to a statement from Ralph B. Utt, General Sales Manager, the new machines are available in ten sizes from 6 feet to 14 feet, measured according to the outside diameter of the drum, and each unit is manufactured in two lengths. In addition, Wemco Drum Separators of appropriate size are offered as a component part of the WKE (HMS) Mobil-mill, the semi-portable, prefabricated mineral beneficiation plant. Smaller units, 30 inches diameter by 30 inches length, are available for conducting continuous laboratory and pilot-mill investigations.

Descriptive literature and complete engineering specifications can be obtained by writing: MINING WORLD, 121 Second Street, San Francisco, California.

New Skookum Block

To prevent line fouling, the Skookum Company, Portland, Oregon, has redesigned one of its blocks. Streamlined in design, the sides are closely overlapped to the sheave. The new product, which has Timken bearings on the chrome-nickel alloy steel pin, manganese steel sheaves, and heat-treated shackles, is known as the 412-A.

Belt Conveyor Carrier With One-Shot Lubrication

SealMaster Ball Bearing Belt Conveyor Carriers, manufactured by Stephens-Adamson Mfg. Co., Aurora, Illinois, combine many important design and construction features in a single unit, including strength, lightweight construction, low power requirement, minimum maintenance, one-shot low pressure lubrication, interchangeable parts, and no tools or adjustments required. SealMaster ball bearing belt idlers with live shaft rollers set a new standard for economical belt-conveyor operation.

They feature rigid, one-piece, welded steel frames, which are designed to tilt in the direction of the belt travel and keep belt centered without need for guide rollers. An inverted angle base and specially designed end brackets shed material and keep rollers free.

Removable rollers and bearing housings are quickly and easily replaced, or interchanged, without tools. Six permanently sealed, self-aligning SealMaster ball bearing units, independent of their housings, are arranged for one-shot, low pressure lubrication from either side of the carrier.

SealMaster carriers have been designed for simplicity, service, and economy . . . they are lightweight, yet strong enough for continuous, heavy-duty service.

To insure maximum rope life, sheaves must be grooved properly. Columbia Steel's Tiger Brand Specialist is checking this feature in a dragline boom–just one of his many wire rope services. Here he recommended regrooving, to prolong the rope's life.

How to stop wire rope trouble—before it starts

The danger of pinching and binding are eliminated when you let this Tiger Brand Field Specialist help you engineer your wire rope installation. He'll check and double-check your equipment . . . measure the sheave grooves to assure proper clearance and support . . . recommend the exact specifications you need for long, tough wire rope life. For his job is to make U·S·S American Tiger Brand Wire Rope work hard, resist bending fatigue and wear, give your machinery better all-around performance.

Tiger Brand Wire Rope is tough, rugged. That's because it's specially engineered for long wear, under constant control from raw ore to the finished product. To be sure that you get all the stamina that hard usage demands, we've put the Tiger Brand Specialist at your service to help you in every way he can. There's no charge or obligation. Simply contact your distributor or any Columbia Steel Company Office.

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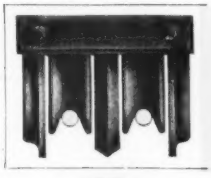


Tiger Brand Tip

Grooves in sheaves and drums should support the rope properly and be slightly larger than the rope to avoid pinching and binding.

USS **U·S·S TIGER BRAND Wire Rope**

UNITED STATES STEEL

precipitates—NORTHWEST

Howe Sound Completes Tests on Cobalt Ore

The Howe Sound Company, which is contemplating construction of a refinery in Idaho to produce cobalt on a large scale, announces that it has completed tests that have proved the feasibility of extracting high-grade cobalt concentrate by a combination roasting and flotation process.

Tests were run for a month period at the U. S. Bureau of Mines station at Salt Lake City on cobalt ores from the Blackbird property of the Calera Mining Company, Howe Sound subsidiary. Some nine tons of the high-grade cobalt concentrate were produced in the pilot plant operation, and the concentrate is now being used for further experimentation to perfect a refining process.

Research to this end is expected to be completed this year, and it is hoped that the final steps, including construction of the refining plant, can be carried out by the end of 1950.

In a joint venture, the *Sunshine Mining Company* of Kellogg, Idaho, is now driving an exploratory drift from the 3,500 level of its Jewell shaft to the *Aberdeen Idaho Mining Company* property. A crosscut already has been driven northeasterly on this level to a point about 25′ south of the Syndicate fault, and from this point, a drift is now being driven in a northwesterly direction parallel to the strike of the fault. The fault zone will be investigated at appropriate intervals by crosscuts or drill holes.

The disclosure that Iron Mountain, north of Weisner, Idaho, may contain uranium-bearing ore was made recently by Geiger-counter prospector Jack Kittlock of Boise. According to Kittlock, the presence of radio-active minerals was noted in an ore sample taken from an old shaft on the holdings of the *Iron Mountain Mining Company* which is currently developing a silver-lead mine.

It is reported that *Sunset Minerals, Inc.*, of Kellogg, Idaho, will increase its milling capacity upon completion of the shaft from the 1,000′ to 1,200′ level. Meanwhile, selective mining is providing a good mill feed, making a profitable operation from a small tonnage.

The newly organized *Clark Fork Silver Mining Company* reports that a 100′ crosscut in the *Whitedelph Extension Mining Company* property at Clark Fork, Idaho, has intersected the Iron vein, carrying high-grade silver values with some lead. If, after further exploration along the footwall, the orebody is of a commercial nature, stoping is scheduled. If not, shaft sinking is being considered. John Hatch of Spokane is manager of the Clark Fork company which is operating the Whitedelph property under lease and bond.

Sunshine Consolidated, Inc., of Kellogg, Idaho, recently started work on a 2,300′ crosscut which is being driven southward from the *Sunshine Mining Company's Jewell* shaft on 2,700 level. Completion of the project is expected in February, 1950. Meanwhile, the 3,100 west drift is being continuously advanced on the Yankee Girl vein, and some stoping is being done from that level. Between 10 and 12 mining shifts are being applied daily to Sun Con area by Sunshine under a working agreement.

Diamond drill operations have been started by the *Highland Surprise Consolidated Mining Company*, Wallace, Idaho, on the Canary vein which parallels and lies 550′ south of the Surprise vein. Last fall, bulldozing determined the mineralized zone to be 100′ wide near the fault, narrowing to 40′ in its westerly course and then widening again. Drill holes will be put down at the surface about every 100′ along the vein which extends 2,200′ from the Placer Creek fault to the west property line.

Development operations have been resumed by the *Sun Valley Lead-Silver Mines, Inc.*, at its property in the Warm Springs mining district near Hailey, Idaho. The company is currently driving a crosscut tunnel to gain about 1,200′ depth on a vein of galena ore from which several shipments of crude ore already have been made to smelters. At latest reports, the new tunnel was in 800′ and nearing its objective. Two promising lead-silver veins encountered, showing mill grade ore at the point of intersection, will be developed later by the company. Present development is in charge of Ross Roundy, president and general manager.

Mining operations in the upper levels of the *Nabob Mining Company* property on Pine Creek near Kellogg, Idaho, are reported to be producing substantial tonnages of ore. Several shipments of concentrates already have been made, funds from which will be used to carry out a development program on the several vein systems cut by the tunnel driven from the creek level last year.

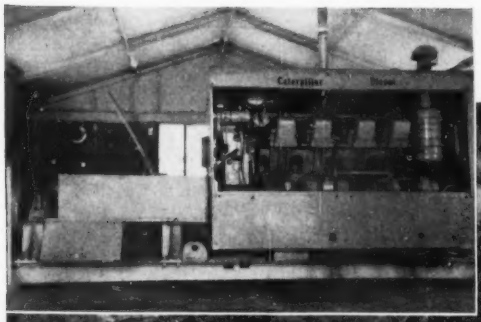
Development operations at the property of *Coeur d'Alene Silver Giant, Inc.*, Kellogg, Idaho, will soon be in full swing, following a winter shutdown. According to company officials, operations will be directed toward cutting a large shear-zone vein at a depth of about 1,500′, nearly 1,000′ deeper than the first three crossed.

A. W. Fahrenwald, director of the Idaho Bureau of Mines and Geology, reports that the Bureau's technical staff will direct its attention to a study of the Hailey area of Blaine County which ultimately may lead to a revival of substantial operations in the district. Formerly one of the most productive areas in Idaho, next to the Coeur d'Alenes, the Hailey district produced $30 million in lead, silver, gold, copper and zinc during its mining history. The area includes Camas, Galena, Mineral Hill, Little Wood River and Warm Springs, among others.

The *Silver Dollar Mining Company*, operating in the silver belt between Kellogg and Wallace, Idaho, has started a crosscut to explore the easterly extension of the Mineral Mountain vein, branching off from its crosscut to the *Purim* group on the 1,800 shaft level. It is expected that the vein will be intersected about 1,200′ from the Silver Dollar shaft.

U. S. Bureau of Mines representatives wil visit the Phillipsburg, Montana, district to re-examine the area as a potential source of manganese for a government stockpiling program, according to an announcement by Bureau Director James E. Boyd. During the war the government stockpiled at Phillipsburg some 80,000 tons of manganese which is now being processed by Taylor-Knapp Mining Company of Phillipsburg and by the Domestic Manganese and Development Company of Butte. Local mining men believe that Granite County has undeveloped manganese resources sufficient to make imports unnecessary.

Good grade lead-zinc ore containing commercial values of tetrahedrite



"This 'Caterpillar' Diesel has plenty of power," says Supt. Donald E. Hunt, Horseshoe Bar Mining Co., Foresthill, Calif. Price of a standard D17000 enclosed clutch power unit is $8430, F.O.B. Peoria. Price subject to change without notice.

This Gold-Getter Depends on "Cat" Power

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DIESEL ENGINES • TRACTORS
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PLENTY of dependable power is needed on this Horseshoe Bar Mining Company's gold dredge. And that's what it gets from its "Caterpillar" Diesel D17000 Engine, which drives a 37.5-kva generator, the dredge, conveyor, screen and 10" pump. Operating at 1200 ft. in temperatures that vary from 15° to 115° F, this big engine does its stuff 24 hours per day, 6 days per week, all year 'round. 1400 yds. are run in 8 hours on this operation on the American River. The company also uses a "Caterpillar" Diesel D7 Tractor for building roads and cleaning up.

Gold may be where you find it, but getting it out profitably isn't a question of luck. You need dependable, economical power—"Caterpillar" power. Your "Caterpillar" dealer is as close as your phone. Get the complete dope on these hard-working big yellow engines from him.

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is reported in three faces of the No. 4 tunnel level of the *Brooklyn* mine, Maxville, Montana, under lease to the *Saranac Mining Company*. This shoot is believed to have returned early-day operators $250 thousand at about one-third of today's prices without concentration. The main vein structure is reported to be from 20 to 30' wide along a major fault zone which has been traced for more than a thousand feet on the surface by bulldozing and surface trenching. The 11 claims that comprise the Brooklyn holdings are owned by the *Black and White Mining Company*, R. F. Little, Missoula, president. Marian Kalez, 1129 First Avenue West, Spokane, is president of Saranac.

Under the general supervision of S. H. Lorain, Chief of the Mining Division, Albany, Oregon Branch of the U. S. Bureau of Mines, a crew of 15 is now developing several chrome deposits in Stillwater County, Montana, first investigated by the Bureau in 1939-40-41. On the basis of the ore disclosed by the Bureau's initial investigations, the Anaconda Mining Company, acting as agent for Metals Reserve, developed the *Benbow* and *Mouat* chrome properties; however, before the mines could be placed on full-scale production, the import situation had eased to a point where the Stillwater County ores were not needed. Now, the Bureau has been authorized to rehabilitate the principal workings, do some diamond drilling to further increase ore reserves and conduct metallurgical experiments to improve ore treatment. J. A. Herdlick is resident engineer in direct charge of operations.

Waite Minerals, Inc., of Grants Pass, Oregon, is now driving a 5' x 7' tunnel in its *Cowboy* mine, one of the properties in its *Queen of Bronze* group which comprises 912 patented acres. Object of the tunnel is to intercept the ore shown in the winze which is said to contain good copper-gold values. The winze is down 110', and the tunnel is being driven 318' lower. Now in 1,209', the tunnel is expected to be directly under the collar of the winze in another 155'. The mine is equipped with a 215 cu. ft. compressor and 2,000 watt electric light plant. If this venture is successful, the firm intends to install a 100-ton daily capacity Mace smelter on a site already decided upon. E. R. Waite is company president.

Placer gold mining operations have been started by the *Brockton-Nevada Mining Syndicate* in Sumpter Valley near Baker, Oregon. Equipment being used in the operation includes a 1½ cu. yd. Bucyrus-Erie dragline, a bulldozer cat and an army bomber four-wheel welder. With 12 men now employed in two shifts, the syndicate is digging 2,000 cu. yds. daily. Harold C. Hally is superintendent, and H. D. Ramsey is local manager.

Judge W. Lon Johnson, part owner of the *Dominion Silver-Lead Mining Company*, has announced the sale of the *Old Dominion* silver-lead mine near Colville, Washington, to Ira M. Hurley and Earl B. Gibbs, owners of the lucrative *Bonanza* mine, also near Colville. It is generally believed that there are large orebodies in the lower workings of the mine, and the new owners intend to carry out extensive exploratory work and determine its geology. The mine, which has a production record of $1.5 million, is in what is known as the "Metaline Lime," a belt three miles wide, extending from the Metaline area south of the Old Dominion. It has been idle since 1927. Three years ago Hurley and Gibbs acquired the Bonanza, also abandoned for many years, and now have developed it into the largest lead-producing mine in the state.

The *Big Valley Gold Dredging Company* has been incorporated at Bremerton, Washington, by R. D. Austin, 523 South Summit, and affiliates. Capitalization is listed at $1 million.

According to recent reports, the *Howe Sound Company's* mill at the *Chelan* copper mine in the Cascade Mountains, near Holden, Washington, is now handling 2,100 tons of ore daily. Last year, all copper concentrates and gold precipitates were sold as produced, although a portion of the zinc concentrate remained unsold at the year's end. This year, however, the company expects that all production will be moved under satisfactory arrangements.

NEW IDAHO PHOSPHATE PLANT

With production scheduled for this summer, Gates Bros., Inc., is rushing to completion a new treble superphosphate plant on a 140-acre tract just southeast of Wendell in southern Idaho. Already completed is the main grinding and pulverizing plant (at right, above), with giant crushing and processing machinery installed, while the phosphoric acid plant (on the left) is nearing completion. A sulfuric acid plant may be added later. Plans call for production of 100 tons of treble superphosphate daily and 100 tons of phosphoric acid. Phosphate ore for the plant will be shipped from southeastern Idaho and western Wyoming so that production of the phosphoric acid may begin by July 1 and the treble superphosphate by September 1.

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Cresson Mine Installing Modern Electric Hoist

Installation of a new Nordberg electric hoist at the Cresson mine has marked the passing of the last steam mine hoist in Colorado's Cripple Creek district.

The new hoist, purchased by the Cresson Consolidated Mining and Milling Company from the Plymouth mine in the Mother Lode country of California, has two drums, each nine ft. in diameter by 90" wide, and will carry $1\frac{3}{8}$ in. cable compared to the $1\frac{1}{8}$ in. rope formerly used.

The steel shaft on which the two drums will be mounted is 39' long and 15" in diameter, weighing 11 tons. A 500 h.p. 30-cycle motor will be used to operate the machinery.

The hoist was originally built for a 5,000' shaft and will raise and lower the skip at a speed of 1,400' per minute. At present, the Cresson shaft is down about 2,000', but when the tunnel lateral is completed to a point below the present shaft, the distance from the collar to the bottom level will be 3,000'.

Retimbering and rehabilitation are now being carried out at the *Bellevue-Hudson* group, Lawson, Colorado, by *Bellevue Mines, Inc.*, recent purchaser of the property. The new owners are reported to be planning electrification of the old silver-lead producers and extension of the workings. Walter Schweiderman of Syracuse, Kansas, is company president.

A hoist and compressor have been installed by the *Mines Exploration Company* at the "76" mine in California Gulch near Leadville, Colorado, and mining operations are now proceeding on the first and second levels. With a six man crew under the direction of D. E. Webster, present production constitutes several hundred tons of lead-silver carbonate ore monthly.

For the first time in its history, the famous *Cresson* gold mine at Colorado Springs, Colorado, is starting to unwater below the 20th level. According to President Merrill E. Shoup of the *Cresson Consolidated Gold Mining & Milling Company*, the Cresson drainage lateral from the Carlton tunnel was driven 1,477' during 1948. Finally in February, 1949, the first flow of water of any consequence was cut, amounting to 500 to 600 g.p.m. Since that date, the lateral has been driven a total of 1,679', bringing the amount of flow up to around 800 g.p.m. and lowering the water in the mine some eight in. daily. As soon as additional water veins have been cut, allowing the properties to drain, the shaft will be sunk an additional 1,000'. Extremely rich ores are said to have been uncovered in the bottom of the Cresson, and the possibilities of discovering additional ore are said to be good. The property has a gross production to December 31, 1948, of almost $48 million.

It is reported that the *Conejos Corporation* is making preparations to reopen its *Superior Erie* mine near Bonanza, Colorado. Otis A. Roberts, 704 Equitable Building, Denver, is company president.

According to President Merrill E. Shoup of Colorado Springs, *the Empire Lee Mining Company* properties will be shut down this year and possibly during the first part of 1950 due to a lack of milling facilities; however, the company has installed a hoist and skip on the Isabella shaft and has repaired surface structures preparatory to the resumption of mining activities. Normal operations are expected sometime after completion of the new Golden Cycle mill.

At the *Consolidated Caribou Silver Mines* property at Caribou, Colorado, development on the 1,040 and 500 levels is proceeding. A raise on the 1,040 is being driven in the pitchblende orebody, and five drifts are being driven on the same level, one of them a newly discovered vein. Five diamond drills are operated on the 1,040 level. The raise in the pitchblende orebody amounts to 120', and good grade silver-lead ore and pitchblende continue to be visible. The development on the 500 level consists, at present, of two headings. One is the drift in the direction of "Seven Thirty" and the other along the "No Name Vein." A new hydrojib and car loaders arrived on schedule and were put into operation. The mine is operated with two shifts working six days weekly.

The *U. S. Vanadium Corporation* and Atomic Energy Commission have signed a contract calling for the rehabilitation and operation of the corporation's uranium-vanadium pro-

CALLAHAN ZINC-LEAD'S AKRON UNIT

The most successful operation of the Callahan Zinc-Lead Company since it withdrew from Idaho's Coeur d'Alene mining district has been the Akron Unit, or the Whitepine silver-lead mine in Gunnison County, Colorado. Under development since 1937, the mine had its most productive year in 1948. The flotation plant, completed late in 1947 at a cost of more than $170 thousand, treated 18,158 tons of ore to produce 4,379 tons of zinc concentrates and 2,511 tons of lead concentrates with a gross value of $1,121,738. Characteristic of the mine is the heavy swelling ground which causes relatively high underground costs and prevents ore being blocked out too far in advance; however, development work carried out during the year maintained ore reserves at the rate of one ton for each ton mined. At the present, exploration work is opening new areas where it is hoped ore will be found.

cessing plant at Uravan, Colorado. The contract requires the corporation to rehabilitate the townsite as well as to install new equipment and facilities at the plant. Expected to be in operation by the end of the year, the Uravan plant will be the fifth of its kind for the treatment of uranium-bearing minerals on the Colorado-Utah plateau. Part of the ore supply for the plant will be taken from properties in the Calamity, Colorado, area, acquired by the government during the new contract. Additional ore will be obtained by the corporation from its own properties and from independent miners. The commission has agreed to purchase the output at a guaranteed price until June 30, 1954.

Shaft sinking operations have been started by the *Champion Mines Company* at its *Forest Queen* mine, Cripple Creek, Colorado. The shaft, which already was 950′ deep, is being sunk another 200′, with two stations to be cut at 100′ intervals. The additional 200′ of depth will permit the company to prospect under its workings on the *Jerry Johnson* and *W P H* properties, also being leased by Champion. A crew of five is being employed in initial operations, with possibly two or three shifts to be used as work progresses. Francis Gunn is mining superintendent for the company.

An increase in mine and mill capacity is planned by the *Minerals Engineering Company* of Grand Junction, Colorado, which has assumed the consulting management of *King Lease, Inc.*, which operates the *Camp Bird* mine. Present operations are being directed toward unwatering the old Camp Bird ore shoot, a famous gold producer of some years ago. Norman Ebbley is resident manager.

According to the recently released annual report of the *Golden Cycle Corporation*, Cripple Creek, Colorado, a net income of $251,725 was recorded in 1948 as compared with $8,072 in 1947. This 1948 net income, however, included $206,391 received from disposal of the Midland Terminal Railroad. According to President Merrill Shoup, the mill operated at far below its pre-war production or about one-third its rated capacity. Total tonnage treated was 229,074 tons which included 96,018 tons of ore mined in the Cripple Creek district and 129,730 tons of dump ore.

UTAH

Mining operations were resumed recently by the *Lile Brothers*, lessees of a group of carnotite mines on Polar Mesa near Moab, Utah, owned by the *U. S. Vanadium Corporation*. With a crew of about 10 employed in the initial operations, regular shipments of uranium-vanadium ores are expected to get under way soon.

The most encouraging showing of its current exploratory program was announced recently by the *Ohio Copper Company* of Salt Lake City, when an estimated four ft. of lead-zinc ore was discovered in the *Bingham Canyon* mine in the footwall of the east drift in the Commercial limes. At latest report, no assays have yet been made. Objective of the exploration, which began in January 1947 was to open for development two limestone beds. This entailed rehabilitation of the old mine workings, extension of the shaft 400′ on the incline and driving a crosscut to expose the Commercial and Lark limestones. The objective was reached last August and development of the heavily mineralized zone started.

A small crew has been employed by the *New Quincy Mining Company* at its recently acquired properties near Park City, Utah. More men will be added, it was said, as soon as conditions warrant. Nick Floor of Salt Lake City is company president.

Lessees Paul Soule and Frank Dean are reported to be shipping cars of good ore from the *Frisco Silver Lead* property in the San Francisco district west of Milford, Utah. Present shipments are coming from the 60′ level.

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1—150 KW. G.E., 2.300 v., 3 ph., 60 cyc.

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2—50 KW. 250 v. DC. w/2.200 v. Motor. 75 HP.
1—35 KW. 250 v. DC. w/2.200 v. Motor. 50 HP.

BALL MILLS
3—86 Marcy. 225 HP. Motors. 440-3-60 cyc.
2—75 Marcy. 200 HP. Motors. 2.200 and 440 v.
1—±76 Marcy, no motor
5—Tube Mills. 5 x 8. 5 x 13. w/Motors
1—7′ x 36″ Hardinge Conical. 125 HP. Motor

PUMPS
2—DeLaval Centrif. 1.200 g.p.m., 1.215′ hd., 600 HP. Motor
4—Allis Chalmers 8″ x6″, 1.400 gal., 290′ head
2—Allis Chalmers 6″ x 5″, 200 g.p.m., 560′ hd., w/100 HP. Motors

ELECTRIC MOTORS
1—300 HP., Allis Chalmers Ind., 2.200 v., 3 ph., 60 cyc.
1—225 HP., Slip Ring, G.E., 440-3-60 cyc., 430 r.p.m.
1—200 HP., G.E. Slip Ring, 900 r.p.m., 2.200-3-60 v.
1—250 HP., G.E. Ind., 600 r.p.m., 440 v., 3 ph., 60 cyc.

LOCOMOTIVES
4—Baldwin-West. Battery, 10 HP., 24″ gauge
2—Baldwin-West. Trolley, 250 v., 5 ton, 24″ gauge
4—Mancha Little Trammer. Battery. 18″ gauge; recond.

MUCKERS
2—Eimco 12, 18″ gauge; reconditioned
2—Eimco 21, 24″ gauge; reconditioned

TRANSFORMERS
4—833 KVA. 16.500 v. to 440 v., G.E.
3—25 KVA. G.E. Type OICS. 2.300-220/440 v.
1—100 KVA. 3-phase. Dry. 2.300-230/460. G.E.
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CRUSHERS
1—22″ Symons Cone, Intermediate, NEW
2—13″ x 30″ Jaw. Farrell Co., w/50 HP. Motors
1—8″ x 20″ Blake Jaw
1—Allis Chalmers Crushing Rolls, 55″ x 24″

MINE HOISTS
1—100 HP., Hendrie-Bolthoff, SD, 7,000# pull
1—80 HP., Davis, DD, w/Motor, 750 r.p.m. speed
1—800 HP., Allis Chalmers, DD, Lilly Controls, w/Motor; used to depths over 5,000 ft.
1—175 HP., Single Drum, Washington Iron Works, 700 F.P.M., w/Motor

STATIONARY COMPRESSORS
1—IR Type 10, 12″ and 20″ x 16, 1,000 cu. ft., 2 stage, w/150 HP. G.E. Motor, 2.200 v., 3 ph., 60 cycle starter
1—IR Type XCB, 9½″ x 16″ x 12″, 650 cu. ft., 2 stage, w/100 HP. G.E. Motor, 2.200 v., and starter
1—IR Type XB-10, 9″ and 15″ x 12″, 550 cu. ft., 2 stage; like new; w/150 HP. G.E. Motor, 440 v., 3 phase, 60 cycle
1—IR Type XCB-10, 9½″ and 15″ x 12″, 568 cu. ft., 2 stage

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New Silica Mill Nears Completion in Arkansas

Construction of a mill for processing white amorphous silica is now being completed by Oak Ridge Minerals, Inc., at Rogers, Arkansas. Built of steel and aluminum, the mill will be topped by a 70′ tower, with two wings on either side of the main structure.

Operations are expected to start early in June, with the silica ore being taken from a deposit just four miles east of Rogers. Tests are said to indicate that the vein is at least 40′ wide. Mining operations have been under way at the property for several months, and a substantial stockpile is available for the initial mill operations.

Analysis of the silica, made by the Midwest Research Bureau of Kansas City, shows that the material is among the best ever found in the United States, with representative samples containing 99.7 percent pure colloidal silica and an iron content ranging from .012 to .014 percent.

The decline in lead and zinc prices is resulting in the closure of a number of small Tri-State operations and wage cuts by independent operators not under union contracts. Largest of the operators to shut down was *F. W. (Mike) Evans*, who has closed his three mine shafts at Crestline, Kansas, and his mill at Waco, Missouri. Others reported to have closed include the *Ritchey Mining Company* at Stark City, Missouri, and the *Contact Mining Company* near Baxter Springs, Missouri, both of which employ a small number of men. Meanwhile, larger operators are reported to be contemplating curtailment of operations, especially tailing mills operating on slim percentages of recovery from chats. Another reaction to the decline in prices was witnessed when the *Nellie B. Mining Company* of Cardin, Oklahoma, recently reduced wages of its workers 75 cents a day.

Approximately 1,800 men were laid off in May when the *Calumet & Hecla Consolidated Copper Company* suspended operations at its copper properties in upper Michigan. The mines, which had a high production cost, received subsidies during the war.

The *Copper Range Company*, Boston, is reported to be contemplating closure of its Northern Michigan mines because of the recent drop in the price of copper. The price at which copper stabilizes will, of course, determine the course of action. According to President Morris Lacroix, the suspension of operations by Calumet & Hecla will cost Copper Range between $10,000 and $11,000 a month in royalties from leased lands. The company had a good first quarter, netting $237,450 after federal taxes; however, the second quarter is not expected to equal this amount.

New equipment is being installed at a Federal Works Agency plant at Luckey, Ohio, preparatory to producing beryllium on a substantial scale for the Atomic Energy Commission. Formerly producing magnesium metal, the plant now will be operated by the *Brush Beryllium Company* of Cleveland, with production scheduled for August.

A record shipment of 900,000 tons of iron ore is planned by the *Jones & Laughlin Ore Company* from its *Benson* mines at Star Lake, New York. Last year's shipments totaled 809,000 tons. Three tons must be mined for every one shipped. Jones & Laughlin took over the mines in 1941 and started operations in February 1944, which now employ 550 men.

David P. Reynolds, vice-president and general sales manager of the Reynolds Metals Company, Louisville, Kentucky, has announced the company's purchase of a government - owned aluminum extrusion plant at Grand Rapids, Michigan, for $1.5 million. Built during World War II at a cost of $6,774,000, the plant covers some 39 acres of land and includes buildings, machinery and equipment. In 1946 Reynolds signed a five-year lease to operate the plant, but in August 1947, due to a shortage of gas, it was closed and operations transferred to the company's Phoenix plant. The plant has a rated annual capacity of 10,800,000 pounds of aluminum, and peak production is expected by August or September.

Dredging operations have been resumed by *Pickands Mather & Company* at its *Rabbit Lake* iron ore property near Cuyuna, Minnesota. The work of removing the lake bed material is under contract to the Union Construction & Dredging Company, which had its first operating season at the property in 1948. The project is a suction dredge stripping operation, with disposal of the material a long distance from the property by pumping about 15,000 g.p.m. of both water and material through a 20" diameter pipe line.

The McDowell Company, Inc., of Cleveland has started erecting a 125′ steel headframe which will serve the new *Mather "B"* shaft of the *Cleveland-Cliffs Iron Company* at Negaunee, Michigan, on the Marquette Range. The new headframe will be the first to be built on the range since the company's nearby Mather "A" mine structure. Meanwhile, sinking at the Mather "B" continues with good progress reported. The Hydro-Mucker being used was developed by the Hydrocrane Division of Bucyrus-Erie and in the company's own shops and is arousing much interest among mining men all over the country. The present goal of the shaft is 3,100′, with a possible ultimate depth of 4,500′. About 750 men are employed at the "A" and "B" shafts, and eventual employment of 1,200 is foreseen.

Oglebay, Norton & Company is making arrangements to start sinking 1,700′ below the bottom 35th level of its *Montreal* iron mine on the Gogebic Range in Michigan. A complete hoisting unit will be installed at the 35th level and ore transferred there for hoisting to the surface.

Installation of a small hi-density unit for beneficiating ore not susceptible to treatment in the washing plant is planned by the *Inter-State Iron Company* at its *Grant* mine, Buhl, Minnesota. A similar unit already is in operation at *Cleveland Cliffs' Holman* mine at Taconite, Minnesota.

Iron ore shipments aggregating 300,000 tons are scheduled for the 1949 season by the *Stanley Mining Company* from its *Mary Ellen* mine on the eastern Mesabi Range near Biwabik, Minnesota. Patrick Butler of St. Paul is company president, and

Frank S. Bergstrom is vice-president.

A 1949 production schedule calling for the shipment of 9,500 tons of iron ore daily, as compared with 6,000 tons last year, has been set by the *Inter-State Mining Company* for its *Columbia* mine at Virginia, Minnesota. The Columbia, which has been in operation since 1943, is now down approximately 150' and will eventually be as deep as the Missabe Mountain property with which it will connect when its east wall is mined out. Paul W. Kruse is superintendent of the Columbia.

The *Snyder Mining Company* is now shipping iron ore from its three properties on the Mesabi Range; the *Webb* at Hibbing, the *Shenango* at Chisholm, and the *Virginia*, between Eveleth and Virginia, Minnesota. At the *Webb* mine, the company's largest producer, stripping operations are continuing for expansion on the east side of the open pit. Also in progress is the building of the tailings pond to serve the ore washing plant. At the company's *Martin* mine near Ironton on the Cuyuna Range, diamond drilling is being continued.

Stripping operations with a $1^1/_4$ yd. shovel and three yd. dump trucks are being carried on by the firm of *Hedman and Strand* of Hibbing in reopening the old *Drew* mine on the Mesabi Range northwest of Buhl, Minnesota. A small semi-portable Pioneer washing plant has been erected at the property, and production was expected to get under way during the latter part of May.

The iron ore mining operations of the *Inland Steel Company* were clipped from a 44 to 40-hour week, effective May 1, due to a reduction in this season's ore requirements. Mines affected include: The *Morris* and *Greenwood* at Ishpeming, Michigan, Marquette Range; the *Sherwood* at Iron River and the *Bristol* at Crystal Falls, Michigan, Menominee Range; and the *Armour No. 1* and *Armour No. 2* at Ironton, Minnesota, Cuyuna Range.

The shortage of electric power in northern Michigan has delayed the start of dewatering at two reopened mines in Iron County—the *Riverton* at Iron River and the *Warner* at Amasa. The conversion from steam to electric operation has been so complete that few mines remain that are unaffected by the electric power curtailment.

The Michigan Geological Survey reported recently that explorations and discoveries during the past year have added some 16,000,000 tons of high-grade iron ore to the State's estimated reserves. Exploration was aided by air-borne magnetometer surveys which allowed geologists to narrow down a 2,200 sq. mi. area to about 800 sq. mi. regarded as a potential mineral source.

Operations are once more under way at the *M. A. Hanna Company's* Portsmouth ore sintering plant at Ironton, Minnesota, on the Cuyuna Range. The only sintering plant on the American iron ranges in the Lake Superior region, it was designed and erected in 1924 to treat Cuyuna Range iron and manganiferous ores containing low silica and high moisture ore.

It is reported that the Trout Lake washing plant at Coleraine and the Mountain Iron plant at Mountain Iron, Minnesota, operated by the *Oliver Iron Mining Company*, may this year exceed the 1948 output of 3,000,000 tons of iron concentrates, total of the combined operations.

Shipments of iron and manganiferous ores from Minnesota's Cuyuna Range got off to a good start this season.

Participating thus far in the shipments are: The *Hanna Coal & Ore Company*, *Inland Steel Company*, *Pickands Mather & Company*, and *Zontelli Brothers*.

Mining operations have been started by the *North Range Mining Company* at the *Champion* iron mine, Beacon, the *Book* mine at Alpha, and the *Blueberry* mine at Ishpeming. The company expects to ship some 100,000 tons of ore from the Champion during the 1949 season.

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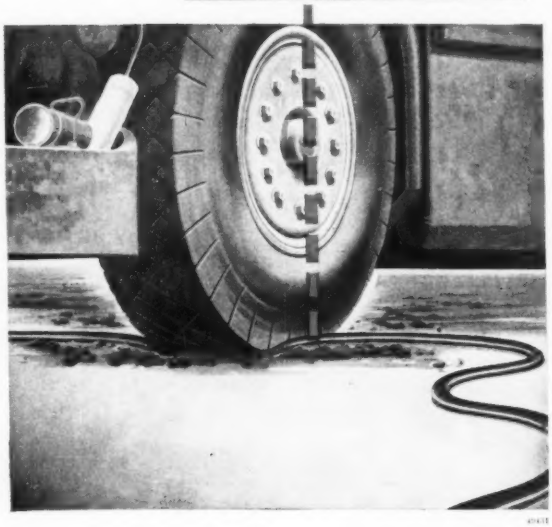

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New Potash Refinery Now Operating at Carlsbad

Operation of the International Minerals & Chemical Corporation's new refinery is now well under way at Carlsbad, New Mexico, America's potash center. Completed at a cost of $1.5 million, the refinery was constructed by the Stearns-Roger Manufacturing Company of Denver, while the preliminary design was contributed by the Western - Knapp Engineering Company of San Francisco.

A. Norman Into, vice-president in charge of International's potash division, said the new refinery will help satisfy the demand for a high-grade chloride in the electrolytic processes relative to the production of caustic potash in the United States. Coincident to this production of high-grade chloride, a revised process for the production of improved potassium sulphate is now being used in the new plant.

Maximum capacity of 20,000 tons annually, to be achieved later this year, is expected to require a substantial number of employees, in addition to the 750 now on the corporation payroll at Carlsbad.

ARIZONA

Lessees A. B. Peach and R. L. D'Arcy, operators of the *Verde Exploration Company* property at Jerome, Arizona, report that the underground crew has been cut from 35 to five and production virtually stopped. The property had been producing about 1,000 tons of gold, silver and copper monthly.

Due to the recent break in base metal prices, all operations at the *Abril* mine have been suspended by the *Shattuck Denn Mining Corporation* of Bisbee, Arizona. Previously, production was suspended following the veto of the premium price legislation in 1947 to be resumed in the summer of last year. J. A. Wilcox of Bisbee is general manager.

Development work is continuing at a group of 11 lead-zinc claims in the Plomosa district of Yuma County, Arizona, owned by the *Southern Cross Mining Company*. The tunnel has now been driven some 150', and a raise to the surface has encountered the vein 24' above drift level, averaging 40" in width. Ore values are in lead and zinc, with some silver and gold, and one to two cars weekly are being shipped to the American Smelting & Refining Company smelter at El Paso. Nine men are employed, under the direction of L. A. Aplington, Box 42, Quartzite. L. H. Bachner, 1020 North Kolmar Avenue, Chicago, is company president.

Ringwald and Willis, agricultural gypsum dealers, have acquired a lease from "Cactus" Johnson on a gypsum mine a few miles from Salome, Arizona, with plans for the immediate erection of a 100-ton lead-zinc concentrating plant. A belt conveyor system and a hammer crusher already have been installed at the property, and the new operators are now trucking gypsum to Blythe, California.

The newly organized *Yucca Mining and Milling Company* has announced its plans for a new mill and concentrator of 100-ton capacity at the *Antler* copper-zinc property near Yucca, Arizona. The mine is owned by the *Arizona Antlers Mining Company*, while the *Faire Mining Corporation* of Golden, Colorado, holds an option on the property. The new firm has leased the property with a view to later purchase. Approximately 50,000 tons of ore already have been blocked out, and ore is being stockpiled pending completion of the mill.

Rio Del Monte Mines, Inc. is installing a 35-ton pilot plant at its property near Salome, Arizona, with a view toward working out the flowsheet for a larger plant. A well-equipped camp has been established, and development is continuing. Ore values are in gold, silver, copper and lead. In all Rio Del Monte has more than 50 veins of commercial size, and gallium was recently found on the property. O. K. Gilliam, 11 East Van Buren Street, Phoenix, is company president.

At the *Black Range* mine, adjoining the Victoria Gold Mines Company property on the east in the Oatman district of Arizona, exploration of a shallow tunnel and winze area is reported to have disclosed good gold ore values for a length of 110' over vein widths averaging three ft. An intensive development program is planned for this ore zone as well as a 25-ton plant to handle development ore. J. W. James is the mine's owner and operator.

A. Villeneuve of Tombstone, Arizona, recently purchased half-interest in the *Apex* group of lead-silver claims in the Swisshelm mining district and is now making arrangements to resume operations. The claims are on the east slope of the Swisshelm Range, about 30 miles east of Elfrida.

The *Golden Crown Mining Company* of Crown King, Arizona, has now completed the ventilation raise being driven at its *Tiger* mine from which it is mining approximately 1,000 tons of lead-zinc-copper ore monthly. Thirteen men are employed under the direction of Silas P. Silverman, president, and H. B. Salisbury, superintendent.

Discovery of uranium ore has been reported at the *Kid Sample* mine in Pima County, about 45 miles southwest of Ajo, Arizona. The extent of the deposit is, as yet, unknown; however, samples are said to run about five percent uranium in the natural state. Further studies of the samples and formation will be made by the Arizona Department of Mineral Resources, and if these studies substantiate present indications, the find will be submitted to the U. S. Atomic Energy Commission for examination.

Production figures for 1948 have been released by the *Phelps Dodge Corporation* for its Arizona properties. During the past year, 493,449,765 pounds of copper was produced. Of this total, 296,030,696 pounds came from the *Morenci* Branch which treated 15,567,480 tons of ore for an average of 48,954 tons daily. This compared with a daily average of 47,911 tons in 1947. The ratio of waste to ore was 1.30. At the *New Cornelia* Branch, 110,062,421 pounds were produced, with the concentrator treating 7,734,952 tons of ore for an average rate of 25,278 daily. In 1947, 23,810 tons were handled daily. The ratio of waste to ore here was 0.77. Copper production from the *Copper Queen* and *United Verde* Branches amounted to 36,587,178 pounds and 29,833,400 pounds, respectively. United Verde development work proved generally disappointing, and unless new discoveries are made, the mine will be shut down in a year or two when the ore reserves are exhausted.

The *Union Gypsum Company*, Box 1848, Phoenix, is maintaining shipments of gypsum at the rate of 1,000 tons monthly from its open pit operation in the Saddle Mountain district near Winkelman, Arizona. Equipment includes one power shovel, drills, compressors, etc. and necessary haulage trucks. Roy Langford is superintendent of the six-man crew, and C. M. Rogers of Phoenix is company manager.

(Continued on Page 78)

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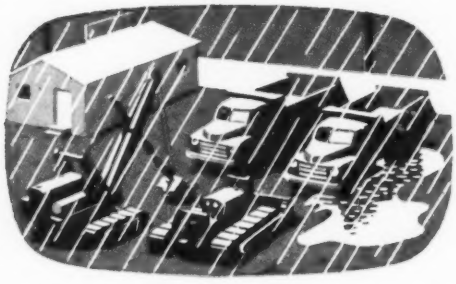

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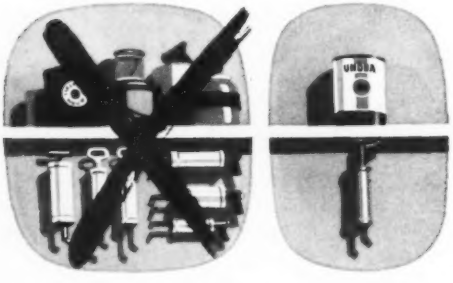

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Southwest

(Continued from Page 74)

Having shipped 12 carloads of one oz. gold ore during the first three months of the year, Lessee R. A. Burney has resumed development work at the *Stove Lid* mine in the Old Hat district near Oracle, Arizona. The mine, which employs a crew of three, is developed by a 65′ shaft.

Olsen Bell, Oregon mine operator, has leased and optioned to an Oklahoma oil company his *Cleopatria* mine which is on the south slope of Mt. Cleopatria, two miles south of the Oregon border in Del Norte County, California. According to terms of the contract, the Oklahoma company will carry out extensive diamond drilling, drive a tunnel to develop the orebodies, erect buildings and install machinery. Besides copper, the mine is said to contain deposits of commercial chrome.

A group of Kellogg, Idaho, mining men interested in the *Lava Cap Gold Mining Company* property in the Grass Valley district of California have received reports that an estimated $50 thousand would be necessary to reopen the mine. The property, which is equipped with a 400-ton capacity mill, has been idle since a war-time order shut it down in 1943. Production from 1934 to 1943 was more than $11 million from approximately one million tons of ore, principally gold and silver.

L. G. Embree is now producing about 500 pounds of tungsten ore daily from a mine he discovered in 1940 while prospecting on Sherman Mountain, 40 miles from Kernville, California. The only producing tungsten mine in the area, it was opened in 1945 after completing 10 miles of road to an elevation of 5,000′.

Unwatering of the main shaft of the old *Copper Hill* mine, eight miles west of Plymouth, Amador County, California, has been started by Clarence Miller of Petaluma and Victor Bonnefoy of Albuquerque, New Mexico. The shaft, which was badly caved after 40 years of idleness, has been retimbered to the water line and a gallows frame erected and powerful hoist installed. The mine is believed to contain bodies of good grade copper and zinc ore, uncovered but unmined at the time operations were suspended.

Rehabilitation of the old *Horse Mountain* copper property near Eureka in Humboldt County, California, is continuing, and examination of the old workings is said to have disclosed considerable smelting grade ore. Operated on a major scale with about 200 men employed 60 years ago, the mine was acquired last summer by G. L. Speier and affiliates of Arcata.

Fairview Placers of Junction City, California, which purchased the holdings of the *Junction City Mining Company* last fall, has dismantled and moved its 10 cu. ft. dredge to a location near Minersville on the Trinity River, where it is now being re-erected. More than 20,000,000 cu. yds. of material are said to be available for dredging. H. C. Young of Lewiston is superintendent and assistant manager of the new company.

The *Aladdin-Geary Mining Company*, backed by Eastern capital, recently acquired the *Permit* mine in the Whitlock district of Mariposa County, California, and is now repairing the 100′ shaft. The mine, which was reopened two years ago by Harry Odgers, former Grass Valley mine operator, is said to contain considerable mill grade quartz.

The *Thomson Divide Mining Company* of Redding, California, is reported to be planning installation of a bucketline dredge in the Minersville area on Trinity River near Weaverville. It is understood that the dredge will be equipped with buckets of 13 cu. ft. capacity, capable of digging 100′. The company also operates dragline dredges in the Lewiston district and on the Klamath River in Siskiyou County.

The extensive development program started last year has practically been completed at the *Ancho-Erie Mining Company* property in the old Eureka district between Graniteville and Washington, California. Mining is now proceeding on four tunnel levels, and the management is reported to be preparing to step up the mill to approximately 300 tons daily. Thirty men are employed in the operations.

Although *Idaho-Maryland Mines Corporation* produced gold bullion worth $1,705,311 from its Grass Valley, California, properties in 1948, a loss of $144,211 was sustained, according to President Edwin L. Oliver. Conditions materially improved at the end of the year, however, and ore reserves were notably expanded. Two outstanding developments were the discovery of a good vein of mill grade gold ore on the 2,700′ level of the old *Idaho* mine and improvement of the No. 4 ledge. Of the 192,058 tons milled last year, all was taken from the *New Brunswick* property, with the exception of 18,417 tons from the

NEVADA OPERATION EXPANDING

Excellent progress in opening and mining the Hornfels lead-zinc-silver orebody is reported by L. E. Whitcher, president of the Copper Canyon Mining Company, Battle Mountain, Nevada. More than 1,000′ of drifting, crosscutting and raising has been done since last September, and already three stopes have been brought into production, with others to be opened at a later date. According to Whitcher, the ore zone is much larger than originally anticipated, and high production levels are immediately ahead. Current known reserves are sufficient for two years' capacity operations. As soon as production has been built up to a satisfactory level, diamond drilling will be undertaken to explore extensions of the orebody.

Idaho - Maryland. The company is now milling 600 tons daily and recently opened a large area in its *New Brunswick* property to lessees.

A high-grade gold-copper discovery has been reported by Francis Gage from his *High Grade* mine in the Acton district of Los Angeles County, California, 1½ miles south of the Governor mine and a mile south of the well known Red Rover. At the property, a shaft has been sunk to a depth of 90′ and the vein drifted on for 100′. The gold vein is said to be six in. to a foot wide, while the copper glance formation is a foot wide. Gage has erected a 12-ton mill and a headframe, and concentrating tables are now being installed.

J. F. Erisman, former Colorado mine operator, has taken over the *Allured* group of mines in San Bernardino County near Cima, California. The group adjoins that of the New Trail Mining Company which is now being rehabilitated. Together these two properties cover a distance of two miles on the lime contact which has produced considerable copper, gold, silver and some lead. At present, Erisman is drilling a water well for domestic and plant purposes after which development will be started in one of the main deposits known as the Oxide shaft.

Dave Chalmers and Edwin W. Ebbert, operating the *Hazel Creek* mine near Placerville, California, under the name of *Hazel Creek Mining Company*, report that they are now milling good grade gold ore from a vein uncovered by a bulldozer during the opening of a logging road. The property is owned by the Rupley-West interests of Placerville.

Rowe, Gabelic and Buehler, mine owners and operators of Pasadena, California, are now developing and shipping ore from the mining claims of Jeanne Mullinix in San Bernardino County. The claims are said to contain a large deposit of flagstone and hematite.

Clifton O. Norman is planning to start work at the *General Warren* lead-silver-zinc mine in the Cosmo mining district of Inyo County near Darwin, California. Norman recently leased the property from Mrs. Marie Wilson of San Francisco.

Production of lead-silver-zinc ore is scheduled to begin shortly at the

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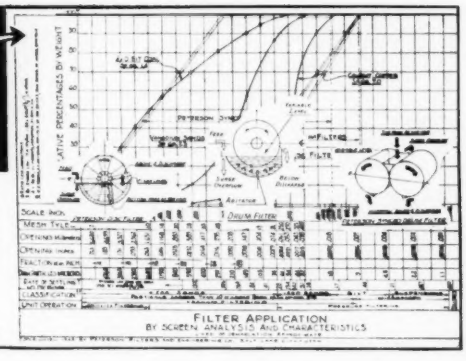

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50-ton capacity Westgate mill, now being reconditioned by the *Broken Hills Mining & Milling Company* of Hawthorne, Nevada. The mill, which is situated between Fallon and Austin, will treat ore from the company's Broken Hills mine, 20 miles distant, as well as custom ore from lead-silver properties at Downeyville, Gabbs Valley and other nearby districts. The company plans to eventually mill 100 tons daily. At the mine, development operations are proceeding from the 800′ Crown Point shaft, where an orebody six ft. in width and averaging $30 a ton is said to be exposed.

Following two years of drilling operations on mining claims north of Tonopah, Nevada, the *Calumet & Hecla Consolidated Copper Company*, through its subsidiary, the *Tonopah Development Company*, has suspended work and dismantled the drill. During the two-year period a total of eight holes were drilled, varying from 1,500 to 1,800′. Results of drilling have not been released as yet.

A contract was recently awarded to a Reno firm by the *Kennecott Copper Corporation* for the removal of 1,500,000 tons of waste from the west extension of the great open pit at Ruth, Nevada. The stripping program, involving an electric shovel and eight trucks on a two shift basis, will expose additional ore reserves for power shovel mining. Present reserves are estimated at some 50,000,000 tons, sufficient for 10 years capacity operation. Most of the 350,000 ton monthly production is coming from the open pit, although a substantial tonnage is mined underground by the caving method from the Star Pointer shaft.

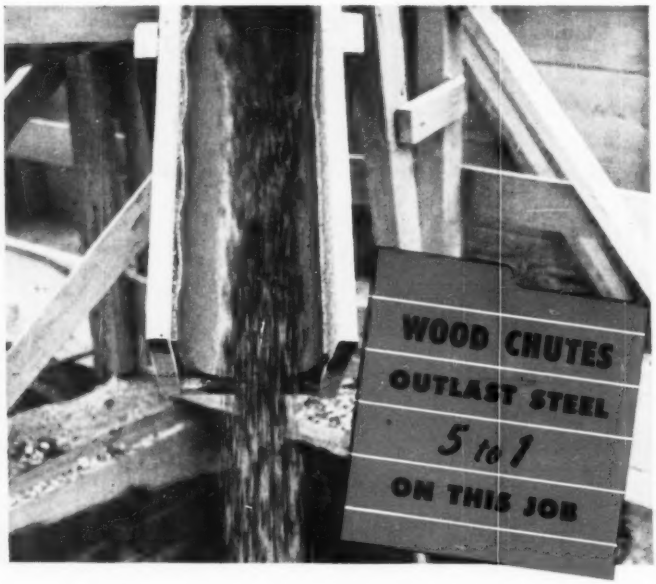
The 250-ton cyanide mill below Silver City, Nevada, has been placed in operation again by the *Dayton Consolidated Mines Company*. During the four month shut down period, stopes were extended between the 600 and 800′ levels in the *New York* and *Keystone* properties so that a 3,500 ton stockpile was available at the start of milling. The company is also receiving custom ore, and an increased crew will allow the mill to operate at capacity.

The recent drop in the price of copper has resulted in the dismissal of 35 underground workers at the Kimberly, Nevada, operations of the *Consolidated Coppermines Corporation*. According to A. J. O'Connor, general manager, the new lower price made uneconomical the continued mining of certain low-grade portions of the Morris orebody.

The property of the *North Standard Mining Company*, Eureka, Utah, in the Tacoma mining district of Eastern Nevada, has now been equipped with a compressor, hoist, rails, mine cars, etc., in order to stimulate production. Lessees operating on the Tacoma property last year shipped 52 tons of ore, all obtained by hand methods, which averaged 29 percent lead. With installation of the new machinery and equipment, a second group of lessees has been added.

Operations have been resumed by a crew of eight at the *Ogee-Pinson* open pit gold property south of the Getchell mine at Red House, Nevada. As in the past, ore will be treated at the Getchell mill. Robert B. Spitzer is manager, and Charles H. Ogee owner of the property.

The *Standard Cyaniding Company*, near Rye Patch, Nevada, reports a profit of $10 thousand monthly since the transfer of its operations from the *Lally* claim to a 100′ orebody in a shear zone on patented ground. The sorted ore is producing $2.50 per ton, and values are reported to be increasing as sinking continues. The deposit is made up of large limestone boulders, cemented together with ore, which are sorted out with power shovels. The cyanide mill is operating at a 500-ton daily capacity.



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Silver Summit Makes New Development Agreement

A working agreement has been effected by the Silver Summit, Silver Dollar and Silver Chieftain mining companies, whereby the former will carry out deep development of the rich Chester vein system through the Silver Dollar and Silver Chieftain ground. Silver Summit will bear the development and mining expense in return for half the ore produced.

First work to be undertaken will be the driving of a raise to connect Silver Summit's 3,000 level with Silver Dollar's 2,800′ level to provide fresh air and a safety escapeway for underground crews. This accomplished, preliminary development will be started on the 3,000 level, although it is understood that main development will be from the 3,500 when the Silver Summit offset shaft is completed.

Silver Chieftain ground will be explored by diamond drilling south from a drift run parallel to the Chester vein in 1948. This drift was run by Silver Summit from its 3,000 level to prospect the Yakima - Shoshone property which it has under option.

Uranium Hunt Gathers Momentum in the West

Prospecting for uranium is now gathering momentum in Northern Wyoming and Southern Montana, where ores are thought to be similar to those of Western Colorado and Utah, now being developed and mined.

The two ores believed to exist in these regions are carnotite, in the lower Cretaceous strata, and roscoite, in the upper Jurassic. These formations, overburdened in Colorado and Utah, are said to be exposed in many places in the Wyoming and Montana regions.

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MANUFACTURERS' PERSONALS

WILLIAM S. LOOSE, former director of the laboratory development section of the Magnesium Laboratory, has been appointed Magnesium Division sales manager for The Dow Chemical Company, Midland, Mich.

D. W. MARSHALL, sales manager for American Brattice Cloth Corp., Warsaw, Indiana, and pioneer in promoting the use of flexible ventilation tubing, died recently of a heart attack.

M. S. DOWNES has been appointed general sales manager of the Railway Division of The Timken Roller Bearing Company. He succeeds the late W. C. Sanders.

HENRY S. CARTER is a recent addition to the mining sales field staff of Mine Safety Appliances Company, Pittsburgh, Pennsylvania. He will locate in Bluefield, West Virginia.

MAC L. CREWS has been added to the industrial sales field force of Mine Safety Appliance Company.

W. M. PARRISH, assistant sales manager, manufacturers' sales, industrial power division, International Harvester Company, retired recently after more than 24 years' service.

PAUL L. MOLNAR has been appointed manager of industrial sales of International Harvester Export Company. Two new appointments on the advertising and sales promotion staff of International Harvester's industrial power division are M. F. PECKELS, manager of consumer relations department and W. H. KUHLMAN as general supervisor of advertising and sales promotion.

RUSSELL W. MUMFORD has been appointed vice-president in charge of technical operations for American Potash & Chemical Corporation.

ROBERT L. BALDWIN has been appointed assistant to G. A. Wallerstedt, western district manager for Hardinge Company, Inc.

J. D. POTTER has been promoted to assistant treasurer of Columbia Steel Company, a United States Steel Corporation subsidiary.

LELAND I. DOAN, newly elected president of The Dow Chemical Company, has announced the promotion of DONALD WILLIAMS from general sales manager to director of sales, the latter position having been vacated by Mr. Doan when he stepped into the presidency following the death of Dr. Willard H. Down in an airplane crash.

RAYMOND E. DANTO has joined the sales staff of Detroit Diesel Engine Division, General Motors Corporation, as a market analyst.

PETER A. BECKER has been appointed general superintendent of Melrose Park Works, International Harvester Industrial Power Division. He replaces Mr. Brooks McCormick, who has been transferred to Kansas City, Mo., as assistant district manager of the general line and industrial district office.

NEW METHODS—NEW EQUIPMENT

Warehouse District Managers Announced

The appointment of Frank B. Stewart as District Manager of the San Francisco warehouse of United States Steel Supply Company, a United States Steel subsidiary, was announced recently by Clifford W. Lord, newly elected Vice-President in Charge of Pacific Coast operations.

At the same time, Mr. Lord announced that Paul C. Van Cleave had been named District Manager of the Los Angeles warehouse of the company.

LETOURNEAU APPOINTS THREE TO WEST COAST POSITIONS

Left to right: George Wacker, district sales representative, has been assigned to the Oakland, California, office as assistant to the Western Sales Manager. He will manage LeTourneau sales activities in northern California until such time as distributor appointments are made. George Goettsche has been named sales representative for a new factory branch established in Oakland which will handle direct sales in the northern California area. A. W. (Buzz) Travis has been appointed district sales representative for Oregon, Washington, British Columbia, Canada and Alaska. He is giving sales assistance to distributors in those areas.

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American Brake Shoe to Expand Sales Activities

American Brake Shoe Company announces that it is expanding its sales activities in Cleveland with the addition of the National Bearing Division in its sales offices at 915 Midland Building. L. E. Hoyer and J. Robert Lottes, National Bearing sales representatives, will join representatives of the company's Brake Shoe & Castings, Southern Wheel, and Ramapo Ajax Divisions in the enlarged office. Their activities will be under the direction of James J. Nelson, Eastern Sales Manager for National Bearing.

With the addition of these representatives, American Brake Shoe will now be able to give more direct service to its customers in the Youngstown, Cleveland, Erie and Buffalo area.

Link-Belt Moves to Larger Quarters in Spokane

Link-Belt Company, nationally known manufacturers of chain, power transmission and conveying machinery, recently moved their Spokane warehouse and district sales office to entirely new and larger quarters at North 1303 Washington Street.

The opening of these new quarters marks another step forward in the company's program to better serve the industries of the great Inland Empire, northern Idaho and western Montana. The new location provides considerably more space for stocks and will allow for carrying of numerous additional items that formerly had to be shipped from the East, San Francisco, or Seattle.

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3—6½-ton General Electric Trolley Locomotives, 36" gauge

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8—1" New Pacific Monobloc Pumps, with ¾ HP motors
30—1½" New Deming Centrifugal Pumps with new 1½ HP G. E. motors and adjustable bases
2—2" Worthington stainless steel centrifugal pumps
2—3" Worthington centrifugal pumps
1—4" Aurora American centrifugal pump
1—6" Krogh centrifugal pump
1—7" Fairbanks Morse centrifugal pump
1—12" Morris centrifugal pump
3—2½" 4-stage Pennsylvania centrifugal pumps
7—3" 6-stage United centrifugal pumps
2—6" Manistee 8-stage centrifugal pumps with 400 HP G. E. motors
1—14" Lane & Bowler 10-stage vertical sinking pump
1—5" Aurora vertical centrifugal pump
1—3" x 3" Allen-Sherman-Hof "Hydro-seal" rubber-lined sand pump
1—6" x 10" Gardner-Denver duplex horizontal pump
1—3½" x 6" Gould vertical triplex pump
1—8" x 5" x 13" Cameron steam pump
1—18" x 12" Worthington duplex vacuum pump
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1—20 HP Ingersoll-Rand 3-drum Slusher Hoist, model 20-MNM-20, 3/60/220-440
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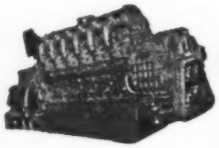

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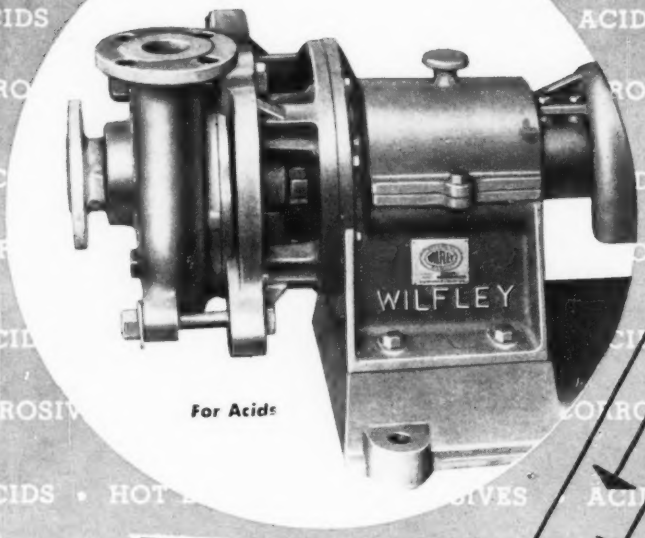

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